VOL. 173, NO. 3 AMERICAN SEPTEMBER, 19
BRITISH SEP 15 1950

Gas Journal

A Handful of Precision . . .

Compact—Lightweight—Durable

This compact Rockwell No. 00 alumi[num] weighs only 11½ lb. It's light, yet stro[ng]—easy for your men to handle and install, ec[onomical] to store and ship. With a full 150 cfh [capacity of] 0.60 sp. gr. gas at ½" W. C. it will [economically] serve the great majority of domesti[c meters. In] years to come the durability and servi[ce built] into these meters will save money fo[r your com]pany. *Get full facts now. Write for bulle[tin 1050.]*

A cinch to repair . . .

Only a screw driver is requir[ed to] [remo]ve the entire working assem[bly] from [the] meter body. It can be re[placed] [in] a few minutes time with [either a] unit or a factory re[built] duplicate.

THE LIBRARY OF CONGRESS
SERIAL RECORD
SEP 20 1950

ROCKWELL-EMCO

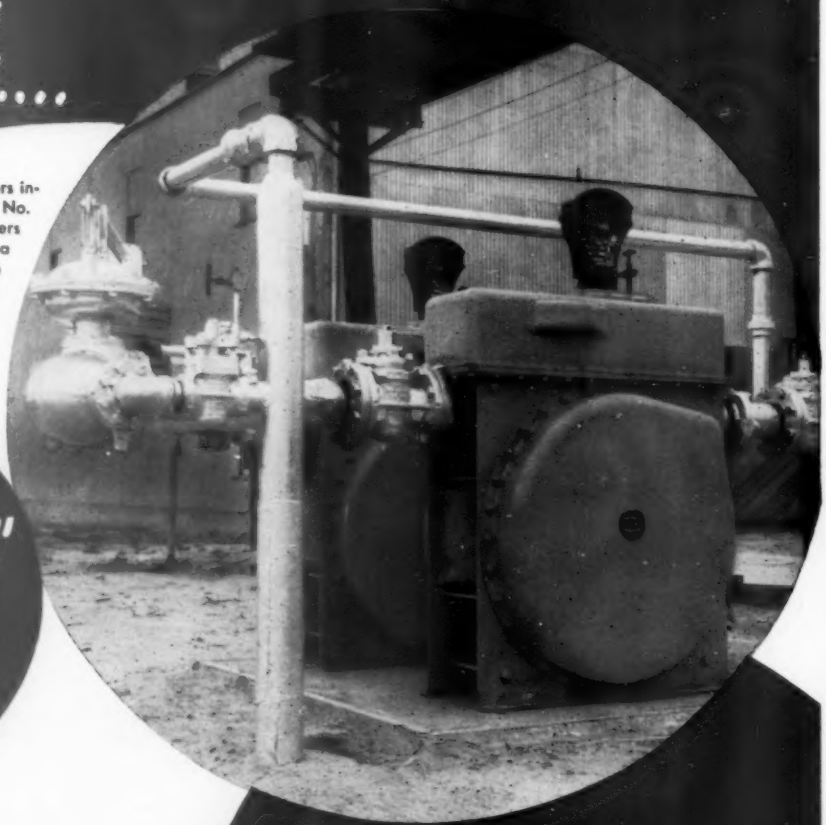
NO. 00 ALUMINUM GAS METER

Pittsburgh Equitable Meter Division
ROCKWELL MANUFACTURING COMPANY
Pittsburgh 8, Pa.

Atlanta Boston Chicago Columbus Houston Kansas City Los Angeles
New York Pittsburgh San Francisco Seattle Tulsa

ROCKWELL-EMCO

METERS and REGULATORS....



Out-of-doors installation of two No. 5 Rockwell-Emco meters with Emcorectors serving a sugar-dehydration plant in Texas. Line pressure is controlled by a Rockwell-Emco high pressure balanced valve regulator and Nordstrom valves.

Built to "Take it"

Inside and Out....

You can rely on Rockwell-Emco meters and regulators to stand up under the toughest operating conditions. Bodies and parts are subjected to rigid test to insure dependable service. The high impact resistance of these units minimizes chance of damage from external causes. Sturdy mechanisms, built around carefully engineered designs, assure long life with minimum attention.

Rockwell-Emco meters and regulators go together like hand in glove. You can make measurement engineered pairings from the most complete selection in the industry.

Here's the reinforced frame of a Rockwell-Emco No. 4½ pressure steel meter. It's built like a skyscraper for strength and stability—to conserve floor area.

Pittsburgh Equitable Meter Division
ROCKWELL MANUFACTURING COMPANY
Pittsburgh 8, Pa.

Atlanta Boston Chicago Columbus
Houston Kansas City Los Angeles New York
Pittsburgh San Francisco Seattle Tulsa

Rockwell-Emco Gas Meters and Regulators for Every Requirement

SEP 14 1950

Basic Principles

SEMET-SOLVAY REGENERATIVE REVERSE FLOW OIL GAS MACHINE*

1. Downward injection of make oil in the reactor *counter-current* to the upward flow of carrier gas. The carrier gas enters the checkerless reactor through an orifice, which induces velocities sufficient to prevent passage of oil vapors or carbon into the section below.

2. Downward flow of make gas through the gas fixing chamber to secure controlled heating of gas for fixing the oil gas vapors.

3. Recycling a substantial portion of oil gas through the reactor. This gas plus steam is termed "carrier gas" and is the means used to propel the gas through the machine.

4. Regenerators to absorb heat from heat oil burner and from the combustion of carbonaceous material deposited during the make period on gas fixing chamber checkers and reactor walls. The regenerators give up the stored heat to primary air and uprun carrier gas. The flow of products of combustion is downward through the reactor and the flow of gases requiring preheat is upward. This follows the physical laws of efficient regenerator operation.

* *Work is now in progress on contracted installations of these machines.*

SEMET-SOLVAY ENGINEERING DIVISION
40 RECTOR ST., NEW YORK 6, N.Y.
ALLIED CHEMICAL & DYE CORPORATION

AMERICAN GAS JOURNAL, September, 1950. Vol. 173, No. 3. Published monthly by American Gas Journal, at 73 Main Street, Brattleboro, Vt. Executive and Editorial offices at 205 East 42nd Street, New York 17, N. Y. Subscription prices: United States $3.00 per year; Canada $4.00; foreign $5.00; single copies 50 cents. Entered as second class matter January 24, 1950, at the post office at Brattleboro, Vermont, under the Act of March 3, 1879. Printed in U.S.A.

EVERYTHING for the Gas Industry

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Condensers

Catalytic Reforming
Oil Gas (High Btu)
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High-Pressure Boilers
Dry Purification
Water Seal Holders
Compressor Stations
Scrubbers (Light oil, Gum, Naphthalene)

Natural Gas Conversions
Oil Fogging
Pipe Lines
Synthesis Gas

KOPPERS

KOPPERS COMPANY, INC.

Engineering and Construction Division

Pittsburgh 19, Pa.

AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 173 / SEPTEMBER 1950 / NUMBER 3

This month...

The manager of a small, but we take it extremely lively gas operation in Kansas, advises us that he thinks the JOURNAL "is crazy and no good." Such candor deserves more than passing consideration. We have invited our choleric correspondent to become a contributor. We will try to remember to report his reaction.

An up and coming young student of chemistry who appears to take seriously these lighter observations writes: "Shipping the JOURNAL in envelopes is fine, but the post office department still managed to crumple my August copy. Why don't you try wooden boxes?" We trust he means wooden boxes for the magazine and not for its editorial staff.

Sackcloth and Ashes Department: After being supplied a story and some excellent illustrations by *United Gas Log*, of the United Gas Pipeline Company, for our July issue we gave the credit line to "United Gas News." *Log* Editor O. C. Irvine took a tolerant and gentlemanly view of the matter. But around here we carried on something fierce; especially when we found we couldn't blame it on the printer.

The *Portland Oregonian* and the *Oregon Journal* both carried Sunday (Aug. 6) features, with credits, built around our August story on the proposed Pacific Northwest pipe line. Practically overnight our restrained respect for these two great newspapers has flowered into unmitigated admiration of their editorial acumen.

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Elliott Taylor · Editor

Howard F. Weeks · Associate Editor

Arthur Rohman · Western Editor **John F. Falvey · Financial Editor**

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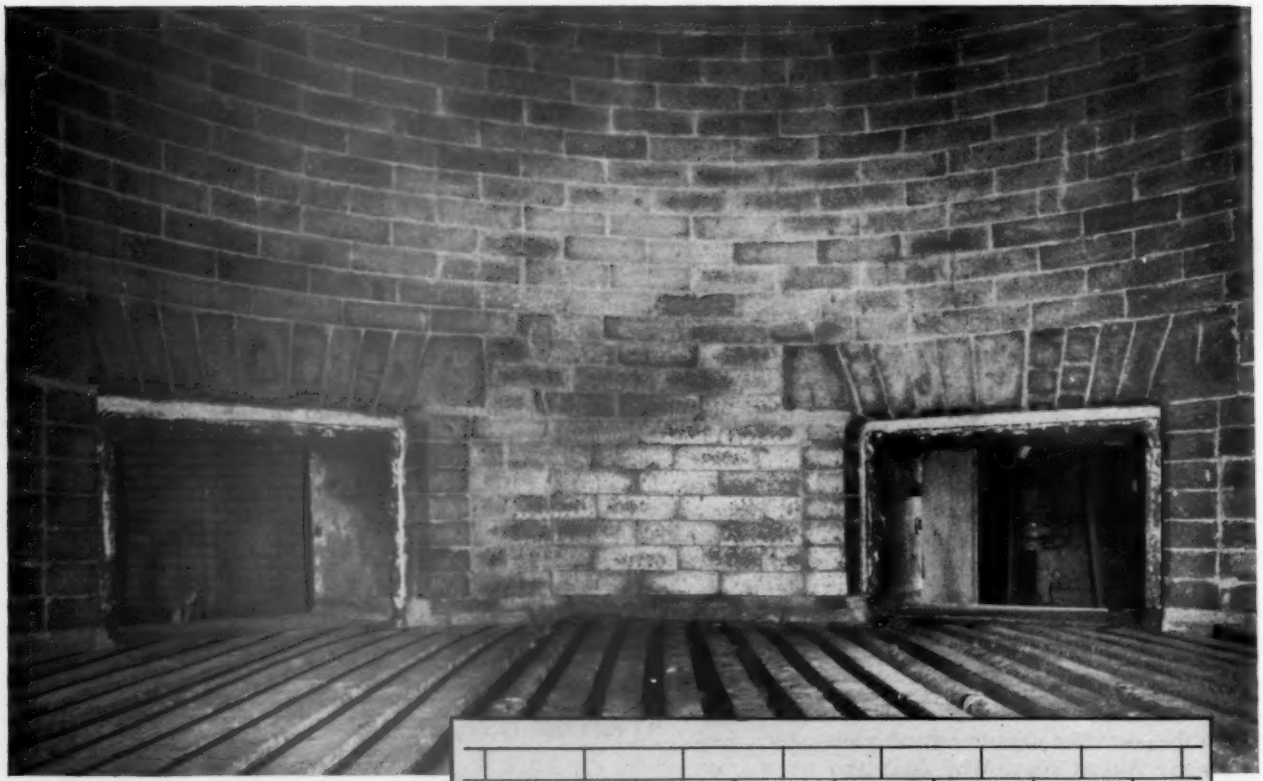
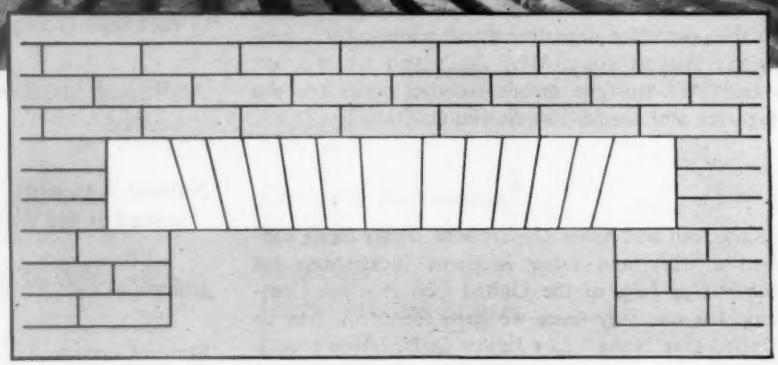


TYPICAL WATER GAS GENERATOR lined with Norton Crystolon* silicon carbide shapes has a life expectancy of at least 10,000 hours without major repairs.

THIRTEEN DIFFERENT ARCH SHAPES of special Norton design are made of Norton Crystolon silicon carbide refractory to add extra life to this typical generator door.



This gas generator has 3 lives!

If you are now using fire clay brick to line your generators, you, too, can multiply your lining's life by three. With fire clay, you can expect approximately 3500 hours without major repairs. With Norton Crystolon silicon carbide linings, many operators are reporting in excess of 15,000 hours.

That's to be expected. Crystolon brick is so dense and hard that slag can't penetrate. When the clinker ring is broken, it just falls free. No roughened surface left on the brick to cause increased slag adherence! No spalling of the wall!

Less Down-Time . . . More Production!

Crystolon shapes are so quick and easy to clean, you not only reduce down-time and cleaning costs but also maintain a larger effective furnace cross-section for maximum production.

Get All The Facts!

A new, free booklet, "Relining and Repairing Gas Generators," is yours for the asking. Contact your local Norton representative, or write direct for Bulletin R. G. 22. NORTON COMPANY, 700 New Bond Street, Worcester 6, Mass.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

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Making better products to make other products better

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Now, that's a brand we know!

Jane and Joe America have *definite* ideas of brands they prefer in everything from cigarettes to motor cars. And when they think of modern home heating, it's *Bryant automatic gas heating!*

Dealers who feature Bryant equipment benefit by association with a name known for quality through nearly a half century. From many satisfied users, their prospects have heard of Bryant comforts, conveniences and reliability.

Look at these other dealer advantages, too. A distributor close enough to know local needs . . . maintaining a stock that permits ordering most everything in gas heating from a single source . . . offering helpful engineering assistance, effective selling materials and localized advertising co-operation.

Utilities, whether conducting promotional or merchandising activities, are tying in with this aggressive Bryant program. It seems that the Janes and Joes who choose the best-known brand usually become the best satisfied customers along *any* main.

Let the pup be furnace man
. . . and water boy, too!

bryant

AUTOMATIC HEATING

The most complete line of gas heating equipment in the nation

Bryant Heater Div., Dept. 197,
Affiliated Gas Equipment, Inc.,
17825 St. Clair, Cleveland, Ohio

( ) Send me the new booklet that tells the Bryant story. ( ) Have your distributor call on me.

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MODEL 44 REDUCING REGULATOR

Here's a faithful worker for your general pressure reduction service. Designed to fit the job—in standard or special sizes. Built for years of loyal performance—in cast iron or cast steel. Model 44 meets every specification requirement—backed by Chaplin-Fulton . . . serving the industry since 1885.

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PRODUCTS

- pressure reducing regulators
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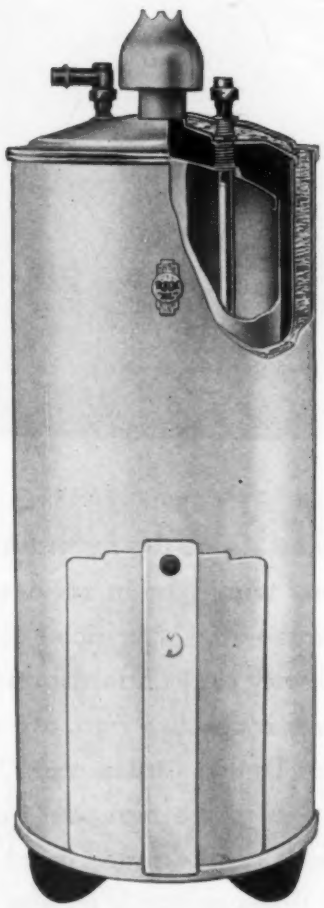
- safety valves
- gas-fuel boiler governors
- regulators for compressor control

ACCURATE CF MFG CO DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 33, Pennsylvania

..... *the new*

REX "XL"



● **OUTSTANDING**

In every detail of construction, design and choice of materials particular care has been taken to build a water heater that will give the most satisfactory service for years to come.

● **PERFORMANCE**

A temperature control knob enables the housewife to have hot water at almost any temperature she desires. Efficient insulation and an efficient burner make the Rex "XL" the most economical water heater designed by Rex engineers.

● **KITCHEN PLANNERS**

A surprise awaits you at Booths 319-320-412 and 413, GAMA Exhibits, Atlantic City Auditorium, October 2d to 9th. Come and see how the

● **REX TABLE-HIGH**

Automatic Gas Water Heater

will fit into the Model Kitchen you are planning. As hot water is more frequently used in the kitchen than in any other part of the house the water heater should be there.

THE CLEVELAND HEATER COMPANY

2310 SUPERIOR AVENUE • CLEVELAND 14, OHIO

Without bursting strength—or, for that matter—without all of the strength factors listed opposite—no pipe laid 100 years ago in *city streets* would be in service today. But, in spite of the evolution of traffic from horse-drawn vehicles to heavy trucks and buses—and today's vast complexity of subway and underground utility services—cast iron gas and water mains, laid over a century ago, are serving in the streets of more than 30 cities in the United States and Canada. Such service records prove that cast iron pipe combines all the strength factors of long life with ample margins of safety. No pipe that is provably deficient in any of these strength factors should ever be laid in city streets. Cast Iron Pipe Research Association, Thos. F. Wolfe, Engineer, 122 So. Michigan Ave., Chicago 3.

CAST IRON PIPE

Strength factors of Long Life !

No pipe that is provably deficient in any of these strength factors should ever be laid in city streets

BURSTING STRENGTH

In full length bursting tests standard 6-inch cast iron pipe withstands more than 2500 lbs. per square inch internal hydrostatic pressure, which proves ample ability to resist water-hammer or unusual working pressures.

SHOCK STRENGTH

The toughness of cast iron pipe which enables it to withstand impact and traffic shocks, as well as the hazards in handling, is demonstrated by the Impact Test. While under hydrostatic pressure and the heavy blows from a 50 pound hammer, standard 6-inch cast iron pipe does not crack until the hammer is dropped 6 times *on the same spot* from progressively increased heights of 6 inches.

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The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

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Hamilton offers the original, only *complete* line of gas dryers. Hamilton *specializes* in clothes dryers only and does not ask you to take on tag-along appliance "extras." Check the superior Hamilton features. See your Hamilton Distributor about the greatest franchise in the clothes dryer industry!

INCREASE PROFITS WITH TWO HAMILTON GAS CLOTHES DRYERS

1. ***Hamilton "Matchless Ignition" Gas Dryer*** **is completely automatic! (No matches required.) Platinum glow coil ignites pilot light. Just set timer and it starts! Model No. 1100-G.**
2. ***Hamilton Standard Gas Dryer,*** **Model No. 1000-G, has same features as Model No. 1100-G except automatic ignition.**

THE MAKER OF AMERICA'S GREATEST NEW HOME APPLIANCE GIVES YOU:

1. **The greatest name in the automatic clothes dryer business!**
2. **The only complete line of automatic clothes dryers—four different Hamilton models!**
3. **Best quality of construction and performance!**
4. **More years of experience and craftsmanship!**
5. **Most service-free appliance you can sell!**
6. **Hardest selling promotions, such as the "Badge of A Drudge" campaign!**

Gas Has Got It for Clothes Drying!

Hamilton Dryers available in Bottled, Natural and Manufactured Gas Models.

In Canada the Hamilton Dryer is known as the Coffield-Hamilton Automatic Clothes Dryer, and is distributed by Coffield Washer Co., Hamilton, Ontario.

See the Hamilton Dryer at the AGA Annual Convention and GAMA Exhibition of Gas Appliances and Equipment, at Atlantic City, N. J., from Oct. 2nd through the 6th.

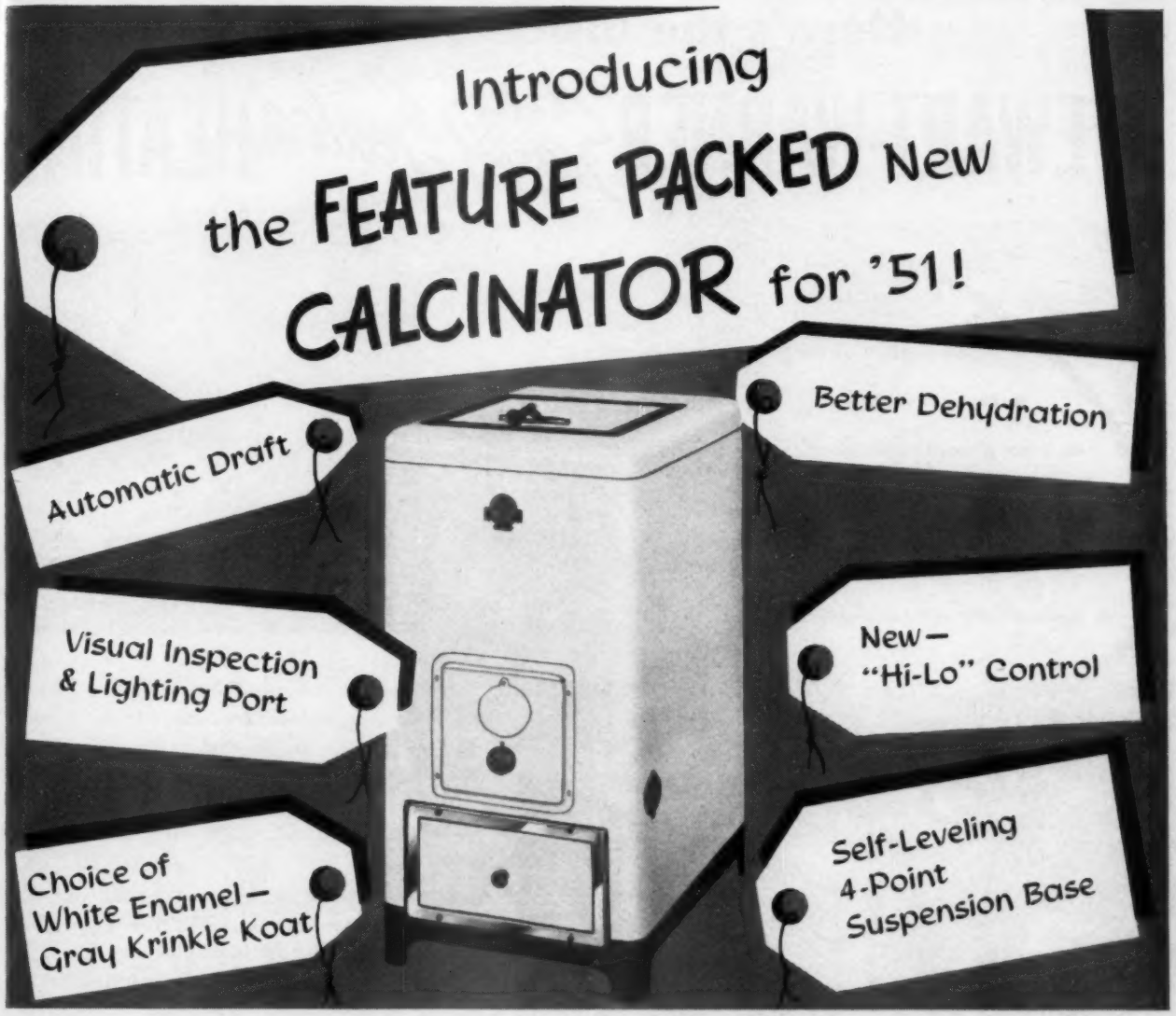
Sign the Franchise with Special Benefits!
Write, wire or phone us for details. Or see your Hamilton Distributor today!
Hamilton Manufacturing Company
Two Rivers, Wisconsin.

The Original Automatic Clothes Dryer

Hamilton

TRADE MARK REG U S PAT OFF.

Automatic **GAS CLOTHES DRYER**



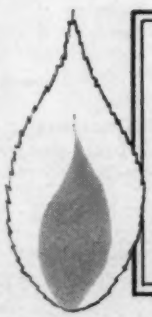
THE AUTOMATIC *Gas* DISPOSAL UNIT THAT GETS RID OF ALL GARBAGE!

"Feature packed"—that's sparkling new Calcinator for '51! Faster dehydration means greater operating economy, customer satisfaction. Calcinator is a goodwill builder for the industry!

Calcinator's simple installation, minimum service, and 24-hour operation can make marginal accounts profitable. Calcinator is a load builder!

New design, including self-leveling base, makes Calcinator smarter than ever for kitchen, utility room or basement. Calcinator has eye-appeal!

Convenient new "Hi-Lo" control offers a choice of moderate calcination for normal loads or a higher rate for rapid disposal. Better disposal is assured by built-in automatic draft and stack temperature control. Calcinator is efficient!



CALCINATOR'S "lo-heat" PRINCIPLE BUILDS AN EVERYDAY LOAD—EVERY SEASON

See the New Calcinator at the Convention

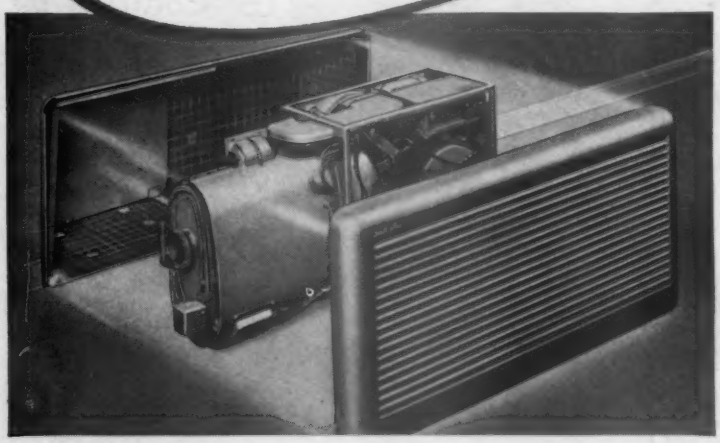
CALCINATOR DIVISION • VALLEY WELDING & BOILER COMPANY BAY CITY, MICHIGAN

Here's the inside story on

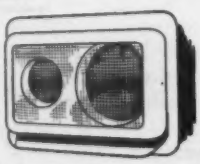
STEWART-WARNER "Safety-Sealed" HEATING

No larger than a suitcase, this versatile, compact unit is a complete and independent gas heating system that...

- **Provides dependable, low-cost zone heating!**
- **Vents all combustion products through a "Safety-Sealed" exterior wall vent!**
- **Uses no room air for combustion!**
- **Can be recessed into any inside or outside wall!**
- **Automatically *self-modulates* heat flow!**



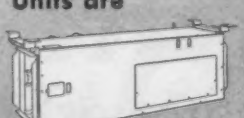
Finger-Tip Heat Control with a conveniently located modulating thermostat.



Small Housing for Exterior Vent—Eliminates chimney or room flue connection. Screened against insects and dirt.

"Safety-Sealed" Combustion-Chamber is hermetically sealed, all-welded stainless steel. Positively seals all combustion products from contact with room air.

These Stewart-Warner Units are "Safety-Sealed," Too!



SAF-AIRE WALL FURNACE. No electricity required. No moving parts to maintain. Installed in any outside wall. Large and small models available in Ivory, Beige, White or Aluminum finish.

SOUTH WIND ZONE FURNACE. Compact, forced-air unit, easily tucked away under the floor, in a closet or any convenient space. Short ducts from centralized installation. Thermostat control.

This compact, "packaged" heating unit for *zone*-controlled heat features Stewart-Warner's Safety-Sealed principle that positively seals all combustion air from contact with room air. Only outside air is used for combustion. And all combustion products are vented directly through a small exterior wall vent.

Easy to install in any inside or outside wall, this independent gas-heating system has a rated input of 31,000 BTUs per hour. Heats any room or group of rooms with a steady, gentle flow of forced-air heat, controlled automatically by a self-modulating thermostat.

Each zone or group of rooms is heated to its individual requirements by a separate, independent *South Wind* unit. Maximum comfort at minimum expense is achieved—*without waste of room, closet or basement space!* Just set each thermostat to the desired level—then forget it!

WRITE NOW for complete, free information and specifications on the complete line of Stewart-Warner "Safety-Sealed" Gas Heating Systems. Address inquiries to 1523 Drover St., Indianapolis 7, Indiana.

Approved by American Gas Association

STEWART Safety Sealed WARNER
DOMESTIC HEATING

IF IT HAD BEEN SCIENTIFICALLY HEAT PROCESSED.

SELAS **Gradiation** MAKES

HEAT A PRECISION TOOL FOR ALL INDUSTRIES

Pipelines are built to cut costs, but costs can be cut before the pipelines are built . . . with scientific heat processing. As much as a million dollars may have been saved on the "Big Inch" if the pipe had been heat processed by Selas Gradiation.

In one large seamless steel tube mill speeds were stepped-up to 240 feet per minute . . . continuous flow of tons of steel instead of batches. Heating was achieved in seconds instead of hours . . . by Selas Gradiation. It has proved its value in better quality and increased production in the hot working of metals —annealing, hardening, drawing, bending, forging and reheating.

Wherever heat is used in processing—chemicals, paints, ceramics, glass, foods, paper, textiles and printing—Selas Gradiation has improved methods and product quality . . . established new high production rates.

Selas Engineering makes heat serve industry as a precision tool for faster, better and less costly production. If you use heat in processing, you can use the new developments of Selas Gradiation . . . and you will be interested in getting more data from our Engineering Department.

HEAT PROCESSING ENGINEERS FOR INDUSTRY . . . DESIGN, DEVELOPMENT, MANUFACTURERS

SELAS CORPORATION OF AMERICA
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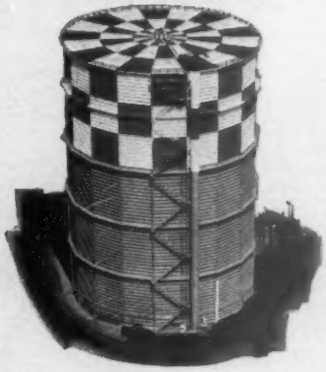
builds *any size* WATER SEAL Gas Holders up to 10,000,000 c. f.

GAS HOLDERS represent a huge capital investment. Make sure you get the most for your money—specify Koppers. Only Koppers is equipped to design, engineer and fabricate *entirely within its own plant* any size Water Seal Gas Holder up to 10,000,000 c. f. And no matter how large the job, when you specify Koppers, you are assured erection will be completed well before the deadline.

In all types of gas plants from coast to coast, Koppers Water Seal Holders have earned a reputation for long life. For example, the Bartlett Hayward Company, now a part of Koppers Company, designed and built its first Water Seal Gas Holder in 1876. *It is still in active service!* The same kind of accurate engineering and rugged construction established then is built into every Koppers Water Seal Holder today.

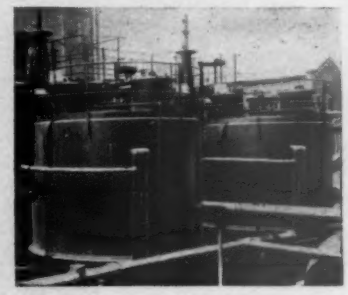
Bulletin 101 contains full technical information and specifications. For your personal copy, write today to: KOPPERS COMPANY, INC., *Gas Apparatus Dept.*, 249 Scott St., Baltimore 3, Maryland.

KOPPERS WATERLESS GAS HOLDERS



Provide long life, low-cost gas storage. Use 1/5 smaller heating plant for winter operation. Take less ground space for equal capacity. Crown is protected at all times, no danger from snow or ice. Painting, other maintenance costs are extremely low. For complete story write for Bulletin 102.

KOPPERS-ELEX ELECTROSTATIC PRECIPITATORS



Ideal investment for gas plants to recover profitable tars, oils, by-products, carbon black, etc., and to clean blast furnace gas used in coke ovens. Efficiency guaranteed to any amount you specify. Every installation designed to your requirements, delivered under one contract. Fly Ash Precipitators for nuisance abatement also available. For full information, write, outlining your problem.

SEND FOR INFORMATION!
No obligation . . . write, listing bulletins you want.

KOPPERS

KOPPERS COMPANY INCORPORATED

METAL PRODUCTS DIVISION, BALTIMORE 3, MD.

GAS HOLDERS • ELECTROSTATIC PRECIPITATORS

Editorial:

Customer Priorities

A NEWS release sent out under date of August 3, by the Gas Appliance Manufacturers Association, advises members of that organization that "One of the first regulations to be put into effect under the Defense Production Act of 1950 will be allocations of steel and related critical materials urgently needed for immediate war needs. A priority system, similar in operations to the one used in World War II will be utilized."

An American Gas Association publicity bureau story dated August 21 announces "The gas utilities expect to add more than three million new house heating customers in the next three heating seasons to the 7,217,000 customers who now heat their residences with gas."

That these two statements should be in effect almost contradictory is understandable. The GAMA statement originated in Washington and represented the situation as of the day it was issued. AGA based its predictions on a survey of its member companies, and reflected the composite estimates of those companies, not on August 21, but somewhere around the first of May when the questionnaires were sent out.

It is hardly necessary to call attention to the fact that the direction and immediate future of our civilian economy have been greatly altered since we picked up the United Nations faltering flag and hoisted it above our own armies in Korea. What anyone thought on May first has been mainly outmoded by events since June 25.

No man can foresee with clarity the road that lies ahead. Opinion is sharply divided on whether this is the preliminary phase of a third global war, or a sanguinary policing action that may end in an uneasy truce when the Korean phase has been settled.

One thing appears certain, however, and that is that preparedness for either defense or war will continue at an accelerating pace, and production for the next phase of our World Mission will continue to cut more and more deeply into the critical materials that will be available for civilian production. While no official allocations are in effect as yet, steel manufacturers have already begun to impose unofficial limitations on the orders they will accept for the last quarter of 1950.

The trend undoubtedly indicates that there will be shortages in gas appliances and equipment, although nobody can say now how early those shortages will be felt, nor how severe they will ultimately become.

Utility planning of promotional and sales activities must be geared to the new realities of the national situation. The primary objective, which a few months ago was to sell all comers to the hilt, must now be altered to selling where it will do the most good, for the industry and the customer.

The AGA has already taken the lead in recognizing this new responsibility. The comfort campaign for house heating has been scaled down. The commercial cooking campaign now accents economical operation of present equipment rather than the purchase of new.

The "Old Stove Round Up" scheduled for September, October and November has been revised (so far as publication dates of the national magazines would permit) to eliminate the forceful message for immediate buying. A new column of copy prepared to accompany the four-color pages, reads in part: "If you have waited until now to buy your new gas range you may have to wait a little longer. . . . Maybe your gas range is a little older. . . . But it's still a wonderful cooking appliance, fast, flexible, faithful. . . . That's why, if you have an old gas range. . . . You can afford to wait a little longer for an equally long-lasting modern gas range."

It does not sit well with sales minded gas utility management to tell their customers that they should "wait a little longer" for anything. And there may be local situations where it will not be necessary. But to be willing to relay, and enforce if necessary, that distasteful message is one of the obligations of leadership.

Regardless of its merchandising policies, every gas utility must exert every effort to see that all appliances sold on its system go to the customers who need them most, when and so long as those appliances are in short supply.

Haze Over Harmony

ALTHOUGH we do not propose to cover in detail the myriad of mysterious activities that are essential to the functioning of the United Nations secretariat, we feel a responsibility to recount one of the little housekeeping problems that has arisen in its new quarters, just a block away from the scene of our own modest labors.

With no intention, we are sure, of creating internal disharmony in the nation that is host, guardian angel, good provider, avenging sword and whipping boy to the United Nations, Secretary General Trygve Lie did venture to remark that it was too bad that a light haze from the generating plant, whence comes UN electricity, should be allowed to dim the delegates' vision of world affairs. His suggestion, that the Federal Power Commission permit Consolidated Edison to replace coal with natural gas as a boiler fuel at this station, met with a cool reception even in world-minded Washington circles.

Couching his remarks in terms of the simple elementary non-sequitur of which he stands undisputed master, President Truman observed "It seems to me that if the Consolidated Edison really wanted to meet the situation it could do it without robbing the ordinary consumer of cheap fuel."

Brother Lie would do well to keep out of the coal versus natural gas dispute. It is too rough a game for any secretary trained on such pushovers as Molotov and Malik.

Elliott Taylor

LOAD BALANCING:
Prerequisite to House Heating

by Elliott Taylor

IN the promotion of house heating on a large scale, particularly by gas utilities who are now experiencing the unaccustomed luxury of being able to offer a mixed or straight natural gas at prices competitive with other fuels, there are inherent problems that far transcend the primitive concept of many utilities (as well as manufacturers of equipment) who once embraced the philosophy that all that is required is to "get out and sell."

It is paradoxical, yet true, that expanded space heating is at once the greatest avenue of potential domestic and commercial expansion for the great majority of utilities, the while it is the greatest threat to stable economical operation of their systems on a year round basis.

Ignore for the moment the industrial and other off-line sales of the natural gas pipe line companies and again it is the foreseeable expansion of their utility customers' heating loads that enables these transmission companies to plan and execute the multi-million dollar projects that have been so spectacular in our national expansion program. Yet the prospect and in many cases the actual experience of a runaway peak demand for house heating has presented the transporters with winter supply problems that have taxed them to the utmost.

Gas, in common with any commodity or service on the market, sells or fails to sell on the dual basis of its price, and generally accepted desirability. These two factors combine to create the effective demand for any merchandise or service that is offered for sale. The effective demand for a product is its market. In the main, sellers of any commodity recognize the responsibility for a twofold job.

They must increase the overall market for the product that they offer, and they must always expand proportionately their own share of the net business that accrues from the market. To achieve the first objective (a general overall expansion of the market) they frequently unite in cooperative, group or association promotions, and many of the leaders in any field undertake on their own responsibility institutional campaigns, with the "good of the whole" the implied or obvious objective.

To achieve the second objective, which is probably paramount in many instances, they seek to improve their product, lower its prices, extol its virtues in advertising and sales promotion, and resort to any other methods that give the buying public a reason, real or fancied, to regard what they have to sell as a better "buy" than anything comparable offered by their competitors.

In the instance of gas, as a regulated monopoly, it is obvious that these factors are never completely operative. Prices are not subject to frequent fluctuation so that acceptability and cost of service to the consumer can be immediately reconciled. And where cost is not a compelling factor, there is practically no competition as far as gas and other house heating fuels are concerned.

Price Spread Narrows

The widespread growth in the demand for natural gas as a fuel has resulted in a large measure from its reliability, price advantages, or near price equality with other fuels. Even the most ardent exponents of coal or oil for house heating recognize that without a price advantage to offset the comparative inconvenience of their methods of heating they are left without any effective argument to influence public acceptance.

Since the end of World War II the price advantages of competing fuels in many localities have tended to disappear. Coal is the most conspicuous example. Prices of bituminous coal for domestic use on the composite national average of the Bureau of Labor Statistics, retail price index, have increased from $10.49 per ton in 1945 to $16.63 in 1950. Anthracite has increased from $14.36 per ton in 1945 to $21.48 in 1950. Allowing for an average efficiency of 60 per cent in the ordinary furnace or house heating boiler, bituminous coal at $16.63 per ton delivered is equal to gas with an efficiency of 78 per cent at 8.1 cents per therm, for house heating. Anthracite at $21.48 with an average efficiency of 65 per cent equals gas at 10 cents per therm.

In the nine years since 1941, domestic heating oil succeeded in attaining an increase in demand of 100 per cent, cutting deeply into the market once enjoyed by coal.

Domestic heating oil prices declined slightly at the end of World War II after a steady increase throughout the country since 1941. The average retail price of No. 2 fuel oil dropped to $0.77 per gallon in 1945, but the following year a continuous upward trend in price set in, reaching $.12 per gallon in 1950.

In the Chicago area in March of 1950 it was estimated by The Peoples Gas Light and Coke Co. that "the cost per annum of gas for heating an average six-room house in Chicago . . . is $119, as compared with the lowest delivered cost of other domestic fuels of $170 for No. 3 fuel oil and $124 for southern Illinois stoker coal."

National figures on house heating are indicative, but not definitive or even accurate in surveying future consumption as far as the individual utilities are concerned. Any company interested in projecting a future house heating load can easily compare its proposed therm rate for heating with that of competing fuels at the average prevailing prices in the gas service area.

Other factors enter into the final calculation of what the maximum heating saturation of a gas company might be expected to be. Dependability of supply, convenience, cleanliness, and automatic operation are probably the most attractive from the consumer's standpoint. It is well to bear in mind that, while heating is a necessity, easy, convenient and automatic heating are at best only comforts, and in many instances luxuries which the potential customer may or may not be willing to pay for.

The house heating saturation of various gas utilities, both natural and manufactured, varies widely in different geographic areas. In the past, and prior to the rapid expansion of natural gas lines, the greatest saturation was always in the areas of the country close to the natural gas supply. Thus in many states of

the mid-continent area domestic heating saturation approached 100 per cent while in the northern areas, by reason of higher priced manufactured gas and more severe climatic conditions, saturations of less than 5 per cent are often encountered, with three per cent being considered a good average operation.

The greatest area of unsatisfied, or perhaps unexploited, demand for gas for space heating lies in the northeastern, central and northwestern states. Experts, particularly those with experience in natural rather than mixed or manufactured gas distribution, are convinced that the saturation in those areas will climb at a rapid rate, once natural gas is introduced.

How rapidly it will climb, or how close to 100 per cent house heating saturation may eventually get, will depend, of course, on local factors, the most important being the price in competition with other fuels. Since every manufactured gas company planning or contracting for natural gas expects to receive it at substantial savings over any present manufacturing processes, it is obvious that sooner or later these savings will be reflected in the rate base.

Parenthetically, it can be observed here that manufactured gas companies are almost all prone to underestimate on first consideration the amount of natural gas that they will require from their pipe line suppliers.

The FPC docket right now is crowded with applications from gas distributing utilities requesting, sometimes demanding, more gas from the pipe lines than originally contracted for.

Almost every city which has, in recent years, introduced natural gas or had it made available in increased quantity since the war, has actually been confronted with a runaway house heating demand.

Auxiliary equipment builds the base load. Here a modern gas fired incinerator stands beside a gas refrigerator. Each consumes about the same quantity of gas in the course of a year's operation.

On August 1, 1949, Michigan Consolidated Gas Co. announced its readiness to connect new heating customers. In four months it received 106,112 new applications, an increase of 97 per cent over those on the lines at the end of 1948.

With 60,000 residential heating customers on its lines, as of May 31, 1950 The Peoples Gas Light and Coke Co., Chicago, had a list of applicants for house heating in excess of 70,000.

On March 19, 1950, the Utah Public Service Commission authorized the Mountain Fuel Supply Co., Salt Lake City, to add 4,800 new gas house heating customers. Within a few hours, over 6,000 applications were accepted and a total of 11,000 were listed before the books were closed.

The discussion so far has concerned itself only with the question of the increased load that can be developed through house heating, or the load that can hardly be restrained, once gas for house heating at a price that makes it desirable has been introduced.

Here the problem of the gas suppliers must be taken into consideration. Since house heating is the new field for exploitation that makes natural gas extension economically possible and feasible, the effect of this type of load, clear back to the gathering lines in the field must be taken into account. Pipe lines require a high load factor for economical operation, and the further the delivery point of gas is from the gathering end of the line, the higher that load factor must be. The reason for this is obvious, the longer the pipe line, the more of the ultimate delivered cost of the gas is increased by interest and charges on pipe line investments. These charges are fixed, and vary only slightly with the quantity of gas delivered. Gas introduced into a line at a price of 8 cents in the Texas gulf coast area may have 32 cents added to that cost by the time it is available for delivery at a point in New Jersey, providing the line is operating at 90 per cent load factor. At a 75 per cent load factor, that cost would be increased to 35 cents per thousand cubic feet.

It has been estimated that the load factor for space heating will vary from 15 to 30 per cent over the country as a whole. While it is true that the gas utilities with a high heating saturation do not operate at load factors this low in the scale, it is equally true that central house heating is the greatest single contributing factor to an unbalanced seasonal load. In New England, for example, many companies use as a rule of thumb the

Laundry dryers are no longer in the novelty class. This one should add 47 therms per year to the base load.

estimate that the winter's coldest day will account for one per cent of its total annual domestic sendout, including heating.

Companies that have been manufacturing gas have realized that as far as their gas making operations are concerned, the responsibility for meeting peak loads is theirs, and their plans for load building have always been kept in alignment with the peak day capacities of the gas plants. But these have been companies in the main where gas heating has been regarded quite properly by their customers as a luxury convenience due to competitive fuel price differentials.

As respects the natural gas supply, the pipe line companies and the producers of natural gas have been the ones more immediately concerned with the trend to unbalanced loads that they foresee in a runaway heating market, if such should develop, at the ends of the long gas transmission lines.

Measures must be taken by both gas transporters and gas distributing utilities to balance the economics of gas supply, with the highest possible domestic consumption of gas, whether it be mixed, reformed or straight natural, for every useful and desirable purpose as far as the ultimate customer is concerned.

Peak Load and Cost of Gas

TO the extent that an increased saturation in house heating adds to the peak day sendout and lowers the annual load factor for any gas utility, it follows that it also tends to increase the cost of all gas sent out at off-peak days or seasons. The manner and the degree in which high peak days affect costs of gas vary of course with the type of operation. The principal new cost item which is introduced by high peaks and lower load factors is occasioned by the necessity for maintaining some form of storage, or standby facilities that will bring the delivery capacity of the utility system up to the anticipated maximum requirement for any hour, any day or any prolonged period.

A commonly accepted rule of thumb among manufacturer gas companies has been to peak shave with low investment, but high operating cost, equipment for 50 percent of the total increase in the heating peak.

The cheapest way to deliver Btu's to any customer is to send gas in a uniform, uninterrupted and unvarying stream directly from the well head or the manufacturing plant to the burner tip. Anything that increases the spread between normal base load and maximum peak load presents a problem that has both economic and mechanical implications.

We are not here concerned with the operating mechanical problems, since they are met in a variety of ways, and since each locality analyzes its own problem of peak sendout and attempts to meet it in whatever way appears to be the most feasible. There are two solutions of the problem of meeting the varying demands of gas customers. One is through increased pipe line or gas manufacturing equipment to take care of the maximum peak—which would be economically impossible if these facilities were to stand idle during off-peak periods, the other is through storage of a type best adapted to the particular type of peak loads anticipated. The table shown on page 19 is one writer's analysis of the costs involved in storing gas and in maintaining peak shaving, all in terms of costs in dollars per Mcf handled.

There is an increasing tendency on the part of natural gas transmission companies to predicate all of their new rates on a demand and commodity charge basis. A recent study made for a pipe line company shows that of 42 companies now transmitting 97 per cent of all of the natural gas moved interstate, 27 companies have demand and commodity rates. Of eight new companies who now have rates schedules on file for approval with the Federal Power Commission, seven propose this type of rate.

One proposed pipe line contract for the New England area is based on a demand charge of $3.75 per Mcf for the maximum peak day plus a commodity charge of 25 cents per Mcf. The demand charge remains at the maximum established by any peak day, for a 12 months period, or until a higher peak day establishes a new maximum.

Thus, regardless of what type of operation a gas utility may decide to go into, upon the advent of natural gas, it is obvious that the high peaks such as are occasioned by house heating must be met with gas that is more expensive to deliver on a therm basis than is the base load.

Heating Peaks Raise Costs

James F. Oates, Jr., chairman of the Board of The Peoples Gas Light and Coke Co., Chicago, summed up the house heating situation in the following words:

*As stated at previous annual meetings, it is a serious question if the present low space heating rates can be justified for the future. . . . The consumers of gas used for space heating during any year require large volumes on the coldest days but in the course of the year have need only for 25 per cent of the gas available to them during the year. This means that space heating business presents the problem of a so-called low load factor. The consumers of low load factor gas must bear the entire cost of the facilities delivering such gas except to the extent that the gas not needed for space heating in warmer weather can be sold for interruptible and off-peak purposes. It now appears that the present space heating rates are insufficient to pay their fair share."

* Report to Stockholders, 1950.

The crux of this observation is that *present space heating* rates are the rates that do not carry their fair share of the load. Utilities have been prone to approach the problem of inadequate revenues with requests from their state regulatory bodies for general rate increases. Where the whole rate structure is too low to give an adequate return on investment, this is of course an unavoidable measure that must be taken.

But general rate increases to compensate for higher costs brought about by a diminishing load factor are a dangerous expedient. The rapid expansion of the acceptance of electric cooking, and to a lesser degree of electric water heating is already a subject of growing concern to many gas companies. There are areas in which this vital base load is right now slipping through the gas company's fingers. To increase the consumer's gas bill for these basic uses is only to play into the hands of the electrical competition.

Summer Inducement Rates

Possible other rate remedies include summer inducement rates, which have been promoted effectively in many areas. Such rates do tend to level out the valleys in consumption; but it is worth remembering that no summer rate can compensate for winter peaks unless the customer has connected appliances that will burn sufficient gas to earn that rate.

A year round monthly minimum for all space heating customers is another device that has had some success. Where these rates are in effect, they tend to effectively discourage any house heating customer from switching to electrical cooking, refrigeration or water heating since the minimum is normally set high enough in therms of gas consumed to just about cover that base load.

Demand charges for house heating are another possibility. The demand charge based on rated Btu capacity of heating burners has worked successfully in several New England companies. Gas executives are acutely cognizant of the drawbacks to this type of charge and these, coupled with the fact that it has not been regarded with favor by many state commissions leads to the conclusion that the demand charge based on rated capacity is still in the future.

Residence Rate To Be Effective When Natural Gas Is Available

RATE:

		Gross	Net
First	200 cu. ft. or less per month	$1.10	$.95
Next	800 cu. ft. per month, per 100 cu. ft.	.365	.35
Next	800 cu. ft. per month, per 100 cu. ft.	.30	.29
Next	800 cu. ft. per month, per 100 cu. ft.	.24	.23
Next 2,400 cu. ft.			
	Winter period usage, per 100 cu. ft.	.17	.17
	Summer period usage, per 100 cu. ft.	.13	.13
Additional gas			
	Winter period usage, per 100 cu. ft.	.12	.12
	Summer period usage, per 100 cu. ft.	.08	.08

Winter period usage shall include the consumption in all billing periods which end between November 26 and May 25 inclusive. Summer period usage shall include the consumption in all billing periods which end between May 26 and November 25 inclusive.

Rate Schedule Applicable to Gas Space Heating Effective February 10, 1949

RATE

First	800 cu. ft. per month @ 21.0c per 100 cu. ft.
Next	1,200 cu. ft. per month @ 10.0c per 100 cu. ft.
Next	98,000 cu. ft. per month @ 8.0c per 100 cu. ft.
Next	100,000 cu. ft. per month @ 7.0c per 100 cu. ft.
Over	200,000 cu. ft. per month @ 6.5c per 100 cu. ft.

MINIMUM CHARGE

$4.00 per meter per month for twelve consecutive months during each annual contract period. Minimum charge will be made each month even though customer orders service disconnected during non-heating season.

Left: A summer inducement type rate as filed with the Public Service Commission of N. Y. by Central Hudson Gas and Electric Corp. Above: Indiana Gas & Water Co., Inc., incorporates a minimum charge feature in its heating schedule.

Auxiliary Equipment—Base Load Builders

The problem of balancing summer valleys and winter peaks is most easily (and probably least satisfactorily) met by acquiring an off-peak, interruptible commercial and industrial load to compensate for the winter peaks built up by a high domestic house heating saturation. It is well to note that this does not include firm commercial load, which, although it is sold at lower rates, must be considered as part of the base load in any analysis of peak load problems.

The advantages of interruptible and dump gas sales are too well recognized to require detailed delineation. They make for a favorable load factor for the simple reason that gas can be turned off when it is needed elsewhere. It is a type of business that requires very little additional investment on the part of the utility. Rates are designed to get the maximum profit from available business, but it is largely sold in a highly competitive market, which automatically sets a ceiling over them, governed by price fluctuations of any suitable competitive fuels.

There are less favorable aspects of interruptible gas sales that also must be taken into consideration. The load is more susceptible to loss in times of business depression than is the residential load. Where it is adopted in industrial processes that can be halted during fuel shortages, widespread labor lay-offs may result, with the blame for the situation laid at the door of the gas industry. There is a growing tendency on the part of the Federal Power Commission to insist on curtailment of gas for inferior uses, particularly that of replacing coal as a boiler fuel.

Without laboring the point further, it is obvious that interruptible sales are indispensable in compensating for heating peaks; but the ideal toward which policy should be directed is the maintenance of the maximum possible load factor in the firm commercial and domestic classifications, as a companion and correlated activity to house heating expansion.

Load balancing at the most profitable rates can be accomplished in a number of ways. The first and most obvious is through the increase of the domestic and commercial base load.

In the domestic field, maintaining and increasing the basic cooking, water heating and refrigeration load have long been recognized as essential to the survival of the gas industry. The greatest sales efforts, the greatest promotion expenditures of both manufacturers of appliances and the gas utilities have always been expended in these fields.

Less actively promoted in the past, but essential to a completely rounded load building program are two pieces of what may be called auxiliary equipment —laundry dryers and incinerators.

Laundry Dryers

The development and public acceptance of automatic clothes dryers has been largely a postwar merchandising phenomenon. Of the several reputable and well advertised makes now on the market, it can be said that all have been field tested in thousands of installations over a period of years, and are no longer

COMPARATIVE ANNUAL COSTS—PEAK SHAVING AND STORING GAS

Type Storage	Unit Size MMcf	Max. Storage MMcf	Total Investment Cost $/Mcf Stored	Total Annual Cost $/Mcf Handled	Uses or Cycles per year	Peak Load Application
Gas Holder	10	—	156	.08	200	Daily
Sphere	1/2	—	227	.12	200	Daily
High Pressure	1/2	50	48	.29	25	Weekly
Underground	—	65,000	.50	.20	1/2	Heavy Seasonal
Liquefaction	50	1,000	13	.25	4	Heavy Seasonal
LP Air 1000 Btu	—	250	7.50	1.70	6 days	Seasonal Shavings
Cat. Ref. 1000 Btu	—	300	3.75	1.54	30 days	Seasonal Shavings
Heavy Oil 1000 Btu	—	—	—	.57	90 days	Seasonal
LP Air 530 Btu	—	470	4.00	1.07	6 days	Seasonal Shavings
Cat. Ref. 530 Btu	—	300	3.40	.98	30 days	Seasonal Shavings

Philip S. Parker, Stacey-Dresser Engineering Co., Oct. 1949.

in the novelty class. This year about 300,000 units will be sold, of which an estimated 50,000 will be gas-fired. Many utilities have amassed a considerable background of experience in handling this particular type of equipment; this has been the subject of numerous reports and articles in the trade publications and is reflected in an ample quantity of selling-help material available from the manufacturers.

Those who have not made a study of the full potentialities of the laundry dryer are prone to regard it as a piece of auxiliary equipment having its maximum use in winter months or during inclement weather. If this were true, it would be of dubious value as a base load or off-peak load builder. However, study of daily usage and peak load figures, taken from the actual experiences of a midwest utility, dispel some of these erroneous notions about the characteristics of the dryer load.

Among other things it has been established that once mechanical indoor drying becomes a household habit, there is very little seasonal variation in use. If anything, it appears to show about a five per cent increase during the summer months. This is due to the fact that during the summer months light colored washable clothes are worn by women and children, and these, of course, necessitate more frequent laundering.

Regarding the day to day use, statistics gathered by a typical utility show that 32.2 per cent of the load is on Monday, with the balance of the weekly fuel consumption distributed about evenly over the days Tuesday through Friday. A table has been compiled from this same company's experience showing the number of days per week in which the dryer is in operation.

The figures indicate a fair division of the load, as follows:

NUMBER OF DAYS PER WEEK IN WHICH DRYER IS USED	
1 day	27.9%
2 days	27.0
3 days	14.5
4 days	4.2
5 days	1.9
6 days	2.9
7 days	7.4
Not indicated	14.2

This table indicates one feature of this type of load that is important in a load balancing program. Monday or single washdays tend to disappear, and instead clothing is laundered in small batches whenever it is required. This tendency has also been noted and capitalized on heavily by the manufacturers of automatic laundry machines.

The Btu input of the installed dryer is constant, although it is obvious that the number of pieces to be washed and dried vary in proportion to the size of the family, the ages and sex of the children, and the type of clothing habitually worn.

As a rough estimate of the probable weekly load a new dryer installation might add, it is suggested that 60 pounds of clothes, dry weight, be considered as a fair average. The Btu consumption would then be approximately

12 pounds (two loads) per hour
18,000 Btu per hour
18,000 Btu x 5 hours
90,000 Btu per week
90,000 Btu per week x 52
4,680,000 Btu per year

Therefore an estimate of 47 therms would be a reasonable one for a family doing ten average domestic washing machine loads of laundry a week.

There is a very important auxiliary benefit to the gas company in getting the dryer load that does not necessarily appear in the annual consumption figures. At present electrical dryers are outselling gas-fired machines by a wide margin. The installation of an electric dryer involves running a 220 volt line into the house. This additional electrical capacity in the house lead poses a very real threat to both the gas cooking and gas water heating load, in any areas where the competition is alert, and the Kwh rate reasonably low.

Utilities that have actively and enthusiastically promoted the sale of laundry dryers are convinced that each installation is a positive factor in holding gas in the home, and preventing competitive fuels from taking its place. This must be regarded as every bit as important as the addition to the base load that this equipment makes possible.

Incinerators

As is pointed out under the sections on laundry dryers and summer air conditioning, any installation that contributes to the base load, aside from heating, or to the off-peak load must be given consideration and sales impetus in a load building and balancing program. Such appliances are generally conceded to justify promotional and selling expense that would at first glance appear to be disproportionate to their annual gas consumption figures.

Any piece of gas-fired equipment that builds the base load can be regarded as an offset for higher peaks in new house heating. The extent to which such an appliance may tend in ordinary usage to be in operation during valley periods of demand make it of still greater importance in a balanced gas load expansion program.

The gas fired incinerator is an appliance that falls within this category. While it is true that the incinerator is designed as an appliance of daily use, manufacturers claim from their experience that its peak period of usage comes in the summer time, and not in the winter when central heating plants are normally operating at or near capacity.

There are two types of incinerators in common use: the on and off type which may or may not be equipped with a pilot light; and the automatic dehydration type which burns continuously. The gas consumption for the on and off type is approximately .2 therm per hour when in use. The continuous type will average from 10 to 12 therms per month, depending on the rated Btu input and the amount of trash and garbage consumed. It is worth noting that this latter figure compares very favorably with the 15 therms per month accepted as the national average for gas-fired refrigerators.

Among auxiliary advantages of incinerator installations is the protection of the base cooking and water heating load. Any installed equipment or appliance that will operate effectively only on gas tends to discourage the transfer of cooking and water heating to electricity.

This appliance can be directly tied in with the installation of automatic gas heating where a coal furnace is displaced. For there, the burnable trash that has habitually been thrown into the coal furnace immediately becomes a nuisance problem.

There are ten manufacturers of AGA approved gas-fired incinerators. Several have alert sales promotion programs that can be tailored to fit any gas utility sales and dealer cooperation policies.

Year-Round Air Conditioning Levels Peak

TO raise the summer valley and improve this pitiful seasonal load factor which afflicts our industry is a possibility to which our best planning and efforts must be applied vigorously and at once." These words are from a recent address by Frank C. Smith, President of the Houston Natural Gas Corp., and one of the first and most effective exponents of summer air-conditioning in gas utility ranks. To this "pitiful seasonal load factor," made so by house heating more than by any other single factor, there is one obvious answer available and immediately at hand—summer air-conditioning.

Air-conditioning is not a base load business, it is a peak business. But its advantage lies in the fact that its peaks occur in precisely the months that are normally valleys in heating demand.

Commercial air-conditioning has long since passed out of the novelty stage.

(Continued on page 38)

The Therm Rate and Promotional Rates For Natural Gas

by George F. Mitchell

President, The Peoples Gas Light and Coke Co., Chicago

I first came in contact with the therm rate while in London in 1923. A report to the Board of Trade by the Fuel Research Board, dated January 29, 1919, recommended that the gas consumer should be charged for the actual thermal units supplied to him in the gas which passes through his meter, and the Gas Regulation Act, 1920, gave legislative effect to this recommendation.

There can not be devised a single set of rates which will cover the industry as a whole. The rates for each property must necessarily be designed to meet the economic conditions that exist in that area, with a full recognition that these conditions change from time to time and that gas rates may have some definite influence in bringing about such a change in the community. In other words, there is no "rule of thumb" basis for operating the gas business or designing its rates.

When The Peoples Gas Light & Coke Co., in the late summer of 1929 purchased approximately 115,000 acres of gas leases in the Texas Panhandle about 1,000 miles from Chicago, we realized many problems would have to be solved before the gas under those leases could be supplied to our customers in Chicago and in the area surrounding Chicago. We recognized that some of the problems might be solved in advance of the arrival of natural gas. For instance, we were supplying 530 Btu Gas. Our research and testing and our operating departments recommended that on the arrival of natural gas we raise the content from 530 to 800 Btu's per cu. ft., an increase of approximately 50 per cent.

We realized we could not afford to deliver to the customer 50 per cent more Btu's in each cubic foot without increasing the price per cubic foot. We solved that problem by getting our Commerce Commission to establish therm rates approximately 15 or 16 months prior to the change in the heating value of the gas. In order to get permission to change to therm rates we permitted the cubic foot rates to remain as optional rates. The customer had to apply for the cubic foot rates. We had approximately 800,000 customers at that time, and when one of them applied for the cubic foot rate we sent a good interviewer to see the customer to determine why he wanted that rate. Almost always when he understood that the therm rate did not increase the amount of his bill he cancelled his request for the cubic foot rate. On the last day the cubic foot rate was available there were only 285 customers on that rate and 805,000 customers on the therm rate; and the Commission readily granted approval to terminate the cubic foot rate. The therm rate did a magnificient job for us and avoided a great deal of confusion in the minds of our customers at the time the heating value of the gas was changed.

Prior to 1930 a number of articles had been written on the therm rate. As far as I can determine, The Peoples Gas Light and Coke Co. was the only company using the therm rate for its general customers in 1930. At the end of 1949 there were about 170 such companies.

Any company facing a change in the Btu content of its gas would do well to give serious study to changing its rates to the therm basis well in advance of the change in Btu standard. Changing the Btu standard brings definite troubles to the company for a period after the change. Adopting the therm rate some months in advance of the change gives the customer an opportunity to understand the rate before the change is made in the Btu content of the gas.

The introduction of natural gas in a community invariably results in cheaper gas for the consumer. If he has been buying 500 Btu gas for $1.00 per 1000 *cubic feet* and has to pay $1.50 per 1000 *cubic*

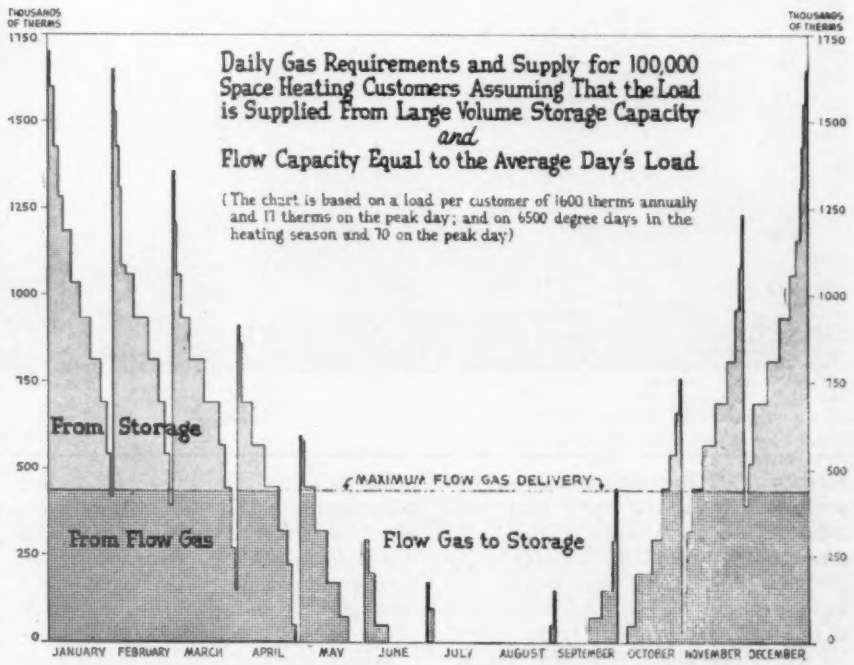


Fig. 1.

Presented at annual convention, Pacific Coast Gas Ass'n, Seattle, July 31-Aug. 3, 1950.

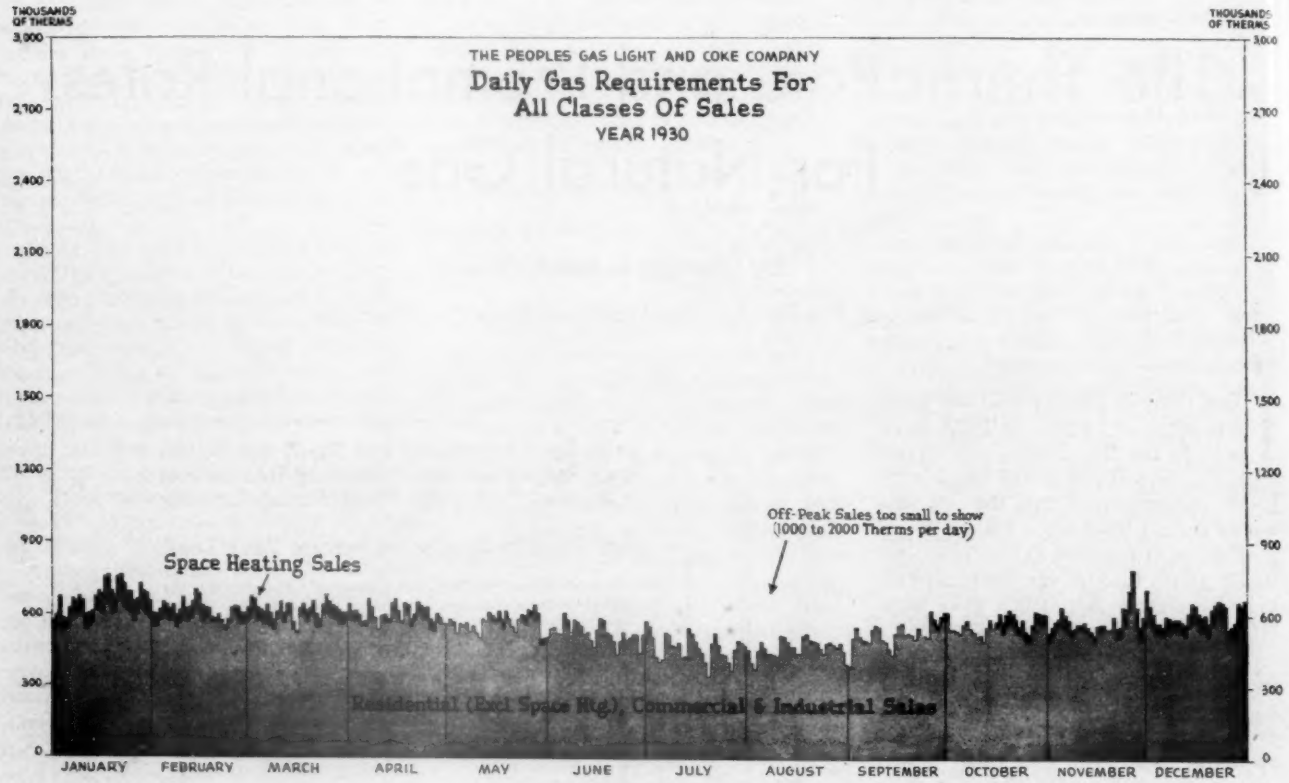


Fig. 2.

feet for 1000 Btu natural gas, he will think his rates are being increased; whereas, they are actually being decreased 25% (from 20¢ per therm to 15¢ per therm). If he has been buying 500 Btu gas for 20¢ per *therm* and then starts to buy 1000 Btu gas for 15¢ per *therm*, he will immediately recognize the reduction in his rate.

Promotional Rates for Natural Gas Sales

When a natural gas pipe line is built into a territory, its capacity is generally much larger than the firm manufactured gas business being supplied. This usually consists of relatively high load factor domestic cooking, water heating and refrigeration; relatively high load factor industrial business; relatively high load factor commercial business, and a small amount of poor load factor space heating.

The increased business available because of the introduction of natural gas usually consists of a *large* amount of poor load factor space heating; a large amount of relatively high load factor water heating, refrigeration, commercial and industrial load, made available by the introduction of follow-on rates; as well as the volumes required to meet normal growth in the area.

In determining how to market the additional gas, the company must take into consideration all of the methods available to it. The first and easiest method is where the marketing company or the pipe line company has available to it underground storage. The second is where no such storage is available.

Where underground storage is large enough to utilize the flow capacity of the pipe line on a 100 per cent load factor basis, the sales problem becomes extremely simple because all of the business attached can be firm business and the rates designed accordingly.

Where there is no such storage available, the sales problem becomes more difficult. It then becomes necessary to secure a substantial amount of interruptible or off-peak business. In both instances, it should be borne in mind that the maximum amount of profit from the industrial business available, whether firm or interruptible, should be obtained for the purpose of keeping the domestic rates as low as possible.

Obviously if the peak is met with flow gas only, disposition of the "valley" gas becomes the problem. If the peak is met with flow gas plus gas from storage, the amount of flow gas required is of course reduced. Where gas is transported long distances, flow capacity is more expensive than storage capacity (if storage fields are available to the market). Consequently, every effort should be made to keep the flow capacity operating on an 100 per cent load factor basis.

Chart I illustrates how 100,000 house heating customers can be supplied with flow capacity of 43,000,000 cu. ft. per day, provided storage is available in an area where there are 6500 degree days in the year, 70 degree days on the day of peak requirements, and where the average customer requires 17 therms on the maximum day with a total of 1600 therms per year. By the same token a flow capacity of 170,000,000 cu. ft. per day can take care of 400,000 customers for space heating, if ample storage is available.

Where there are no underground storage fields available, it is evident that the marketing company must market the "valley" gas. That is the problem which confronted us at the time of the introduction of natural gas in our area in the fall of 1931.

At that time the pipe line company's two-part rate consisted of a capacity charge of $5.54 per month with a commodity charge of 6c per 1000 cu. ft. per month. At 100 per cent load factor this rate delivered gas to us at 24c per 1000 cu. ft. (18c capacity charge and 6c commodity charge). It was easy to demonstrate that any money we secured above 6c per 1000 cu. ft. for sales which were off-peak and which of themselves therefore did not create additional capacity

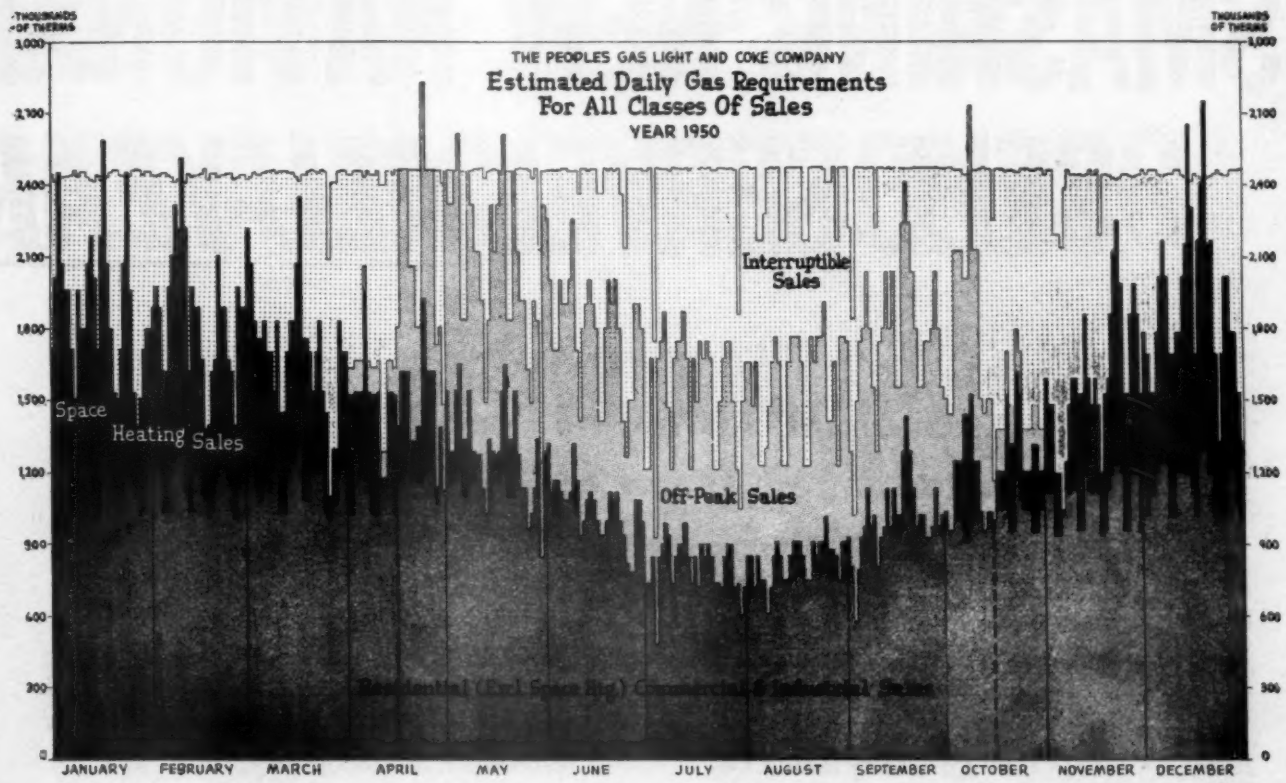


Fig. 3.

(The actual daily gas requirements for the first six months of 1950 have been adjusted to reflect normal temperature conditions.)

charges, would be profitable and reduce the average cost of gas to the company.

The largest fuel consumers in our area were the electric generating stations which used coal as a fuel with only one major station using powdered fuel. There was very little oil used in large boiler installations; interruptible rates seemed to be the logical solution for powdered fuel installations. Studies indicated that we could get the maximum amount of such business at a price of 12½c per 1,000,000 Btu's. There was also in our area a substantial amount of off-peak business which we could serve for a period commencing approximately April 15th in the springtime and ending October 15th in the fall. Practically all of this business had fuel installations which required shutting down for 24 to 48 hours while gas burners were installed in their boilers. However, the price they could afford to pay was substantially higher than the price the interruptible users could afford to pay. So rates were designed accordingly.

The off-peak business was firm for the period involved, with the option on the part of the company to lengthen the period two weeks in the springtime and two weeks in the fall if it had capacity to do so. The interruptible rates were available only to customers who could take a minimum of 35,000,000 Btu's per hour.

Chart 2 represents the daily gas requirements for all classes of sales made during 1930. This chart indicates that we had a fairly good annual load factor. The very heavily shaded portion represents the relatively small amount of poor load factor space heating sales in that year.

Chart 3 represents our estimated daily gas requirements for the year 1950. It is drawn on the same scale as Chart 2. The very dark shaded portions on the right and on the left represent the requirements for poor load factor space heating sales. The off-peak sales are principally from April 15 to October 15. The interruptible sales take place throughout the year as gas is not required for firm purposes.

Sales of peak gas can be controlled by the introduction of interruptible class rates for the very large fuel consumers in the territory. A customer using oil or coal for processing, or under boilers, who is willing to interrupt his regular fuel supply during periods when he can buy natural gas for less money than either coal or oil, agrees to pay for such gas a specified rate with the contractual right on the part of the gas company to discontinue his supply of gas for interruptible purposes on relatively short notice of one-half to two hours.

Naturally, the price for interruptible supply gas must be attractive to the consumer. More money can be obtained for process gas than power plants can afford to pay for raw fuel. Because of the necessity of policing such business, interruptible gas should be sold only to customers with large fuel requirements.

It seems logical that the company should get the maximum amount for each class of interruptible business in order that the revenue therefrom can be used to keep the rates for firm residential and commercial business as low as possible. Not only should the company marketing gas desire such class rates, but the public utility commissions should welcome them, leaving it to the public utilities to design and make changes in the rates where, in the judgment of the utility, such rates are competitively too low to get the maximum benefit for the domestic consumer, or are competitively too high, thus pricing itself out of the market.

Cost of competitive fuels as an appropriate measure of interruptible and off-peak rates is not a novel principle. Numerous regulatory bodies have adopted and applied this principle over a period

(Continued on page 46)

SMASHING NEW NATIONAL C
SELL SERVEL *ALL-YEAR* C

Unusual ads tell millions of S. E. P. readers benefits of only appliance that really fills in your "summer valley"!

Just look at those ads! Aren't they knock-outs! You can see by looking at them what a sensational selling job they do for Servel *All-Year* Gas Air Conditioning.

They hit millions of gas customers right at the height of the heat and hay fever season with the exciting news of the all-year comfort only Servel Air Conditioning can bring to homes, offices, and stores.

Each ad also pounds home the modernity of gas and gas appliances. Here are the words:

"Made by the makers of the famous Servel Gas Refrigerator and Servel Water Heater, it (the air conditioner) *heats and cools with gas — the cleanest, most luxurious, and most popular of fuels.*"

This spectacular campaign helps you whether or not you actively sell Servel *All-Year* Air Conditioners. For these ads build demand for all gas appliances—create new respect for the modernity of gas with the more than four million money-making, appliance-buying families who regularly read "The Saturday Evening Post."

Fills in "summer valley"

Studies show that no other gas appliance can do as much to balance your heating load as the Servel *All-Year* Air Conditioner. It's the equivalent of 25 ranges, 23 refrigerators, or 17 water heaters. Make sure you get the full benefit of the interest created by Servel's newest campaign. Display, talk, sell Servel *All-Year* Gas Air Conditioning. Servel, Inc., Evansville 20, Ind.

Servel

ALL-YEAR **AIR CONDITIONER**

FOR HOMES OFFICES STORES

CAMPAIGN HELPS YOU GAS AIR CONDITIONING

SERVEL PRESENTS THE GREATEST INVENTION SINCE THE HOUSE!
A NEW KIND OF AIR CONDITIONING
One simple unit keeps the whole house comfortable!
Completely automatic!
Cools and dries the air when it's hot and humid!
Heats and moistens the air when it's cold and dry!
Filters out dust and pollen! Circulates air without drafts!
NO MATTER HOW HOT
OR COLD IT IS OUTSIDE
YOU'RE ALWAYS COMFORTABLE INDOORS
SET IT—FORGET IT!
USES GAS—THE CLEAN, DEPENDABLE FUEL
Servel
ALL-YEAR AIR CONDITIONER
1950
MIRACLE
Servel's new kind of automatic All-Year Air Conditioning
Servel
ALL-YEAR AIR CONDITIONER
Modern Magic!
COOLING AND HEATING FROM ONE SIMPLE
Servel
AIR CONDITIONING UNIT
Servel
ALL-YEAR AIR CONDITIONER

Selling summer load for you . . . These sensational advertisements appeared during the hot and hay fever-ish season in "The Saturday Evening Post," one of the greatest consumer-influencing magazines in America. Remember, "People pay attention when they read it in the 'Post.'"

These are two of the 21 units of a complete gas industry museum exhibit which will be unveiled for the public on September 7 at Chicago's Museum of Science and Industry. The Peoples Gas Light and Coke Co. will present the $100,000 exhibit as a permanent part of the Museum in observance of the 100th anniversary of gas in Chicago.

Additional Speakers Announced for AGA Convention

Several speakers, in addition to those listed in the August issue of AMERICAN GAS JOURNAL, have been announced for the 32nd Annual convention of the American Gas Association at Atlantic City, October 2 to 6.

Harold E. Stassen, President of the University of Pennsylvania, will be one of the key speakers on the afternoon program on October 2.

Otto A. Seyferth, President of the United States Chamber of Commerce, will speak on "The Contribution of Business Management to the General Welfare" at a general session meeting on October 3.

W. Paul Jones, President of Servel, Inc., will present "The New Sales Potential of the Gas Industry" at the morning session, October 3. He will be followed by Stanley H. Hobson, President of Gas Appliance Manufacturers Association, who will speak on "Spike Driving With A Tack Hammer."

Prof. Amos E. Neyhart, Pennsylvania State College, will stress the relationship between accidents and vehicle costs at the operating section meeting, October 3. Other speakers at the same meeting include: C. S. Hazel, The Philadelphia Gas Works; John Overbrook, Columbia Engineering Corp.; Jesse S. Yeaw, Rochester Gas and Electric Corp.; and A. B. Lauderbaugh, Manufacturers Light and Heat Co.

Hall M. Henry, NEGEA Service Corp.; G. K. Bachman, Public Service Electric and Gas Co.; G. V. McGurl, Koppers Co.; and Louis Shnidman, Rochester Gas and Electric Corp. will speak to the operating section on October 5.

Dr. J. L. Rosenstein, Loyola University, will talk to the residential gas section and the industrial and commercial gas section on a proposal "If Salesmen Could Choose Their Sales Managers."

Dr. Robert K. Burns, University of Chicago, and Dr. John J. Wittmer, Consolidated Edison Co., of New York, will lead two floor discussions, respectively entitled "Employee Relations and Management in a War Economy" and "Are Greybeards White Elephants."

James F. Oates, Jr., The Peoples Gas Light and Coke Co., will point out the necessity of rendering superlative service in order to retain public favor at a general session meeting on October 5.

W. L. Hayes, Montana-Dakota Utilities Co., will speak to the residential gas section on "Keeping the Public Sold on Gas—An Industry Responsibilty."

FPC Considers Proposals For Southern Pipe Line

The Federal Power Commission has reopened the proceeding involving proposals to build natural gas pipe line facilities in the South and has scheduled further hearings to commence September 25 in Washington.

The proceeding involves applications of Atlantic Gulf Gas, Southern Natural Gas, and United Gas Pipe Line. Atlantic and Southern Natural both are proposing to serve substantially the same areas of Georgia, Florida, South Carolina, and Alabama. United would supply gas to Atlantic.

Exhibition Hours Lengthened For Gas Appliance Show

Harold Massey, manager of the exhibition of gas appliance and equipment at Atlantic City, announced that because of the record-breaking enrollment of 175 manufacturers who will display their products this year, visiting hours for the show will be increased. The exhibition, sponsored by the Gas Appliance Manufacturers Association, will be held in conjunction with the annual meeting of the American Gas Association, October 2-5.

The new visiting hours are from 9:00 AM to 5:00 PM, Monday through Thursday, and from 9:00 PM to 2:00 PM on Friday.

Shenandoah Gas Applies to FPC To Expand Service in Va.

Shenandoah Gas Co. of Lynchburg, Va., has applied to the Federal Power Commission for authorization to build approximately 49 miles of natural gas pipe line extending from a point on Virginia Transmission Corporation's transmission line near Cedarville, Va. to communities proposed to be served by Shenandoah.

Shenandoah's proposed project is estimated to cost $2,300,000, including the acquisition cost of the existing gas distribution system in Martinsburg.

Shenandoah proposes to construct or acquire distribution systems for the sale of gas at retail in the communities it would serve. In the event it cannot purchase the distribution facilities, Shenandoah plans to sell natural gas wholesale to the companies which own the distribution systems. The communities to be served are now using bottle gas and propane air gas.

NATURAL GAS
and
GAS FROM LIQUID FUELS
as presented at the
WORLD POWER CONFERENCE
London, July 10-15

Transportation, Storage and Peak Load Supply of Natural Gas: Smith (US)

NATURAL gas is playing an increasingly important role in the fuel supplies of the United States. Its contribution to the total energy supplies (coal, oil, gas, and water) increased from 10.7 per cent in 1937 to 13.3 per cent in 1947. Gross production of natural gas in 1948 was 6×10^{12} cut. ft.

The expanding use of natural gas and the decline in local reserves, though the known national reserves (now 174×10^{12} cu. ft.) are increasing, has resulted in the rapid growth of the pipe line transmission system which increased from 183,000 miles in 1938 to 240,000 miles in 1948. This great increase in transmission has been made possible by the design and manufacture of large-diameter (26 to 32 in.) thin-walled pipe, and by the development of improved methods of bending and welding.

The large seasonal variation in the demand for natural gas was a difficulty in the way of the development of long-distance transmission, but one method of overcoming it was to supply natural gas for some uses, such as boiler fuel, on an interruptible basis, either buyer or seller providing a standby fuel. By this system some of the pipe lines operate with annual load factors in excess of 90 per cent.

Peak load demands are also met to some extent by the storage of natural gas by three principal methods. The first and most important method is underground storage in depleted gas or oil wells, the investment cost ranging from 2 to 53 cents per thousand cu. ft. of usable capacity. There has been a very great expansion in this method of storage since 1937, and to-day 80 fields are in use with a combined capacity of 440×10^9 cu. ft.

The second method is by storage at high pressure in pipe batteries. These are used to meet peak loads of short duration, and consist of batteries of cylinders fabricated from commercial pipe and usually 24 to 34 in. in diameter and 200 to 400 ft. in length. They are designed to work at pressures up to 1,600 lb/sq. in. The lower cost of such batteries in comparison with conventional holders more than offsets the higher compression costs. There are at present two pipe batteries in use in America having capacities of 40×10^6 cu. ft. and 516,000 cu. ft.

The third method is by storage of natural gas in the liquid form. This method is receiving favourable consideration in America, but is not used on a large scale, and is not discussed in the paper.

Production, Utilization of Natural Gas in France: Moch and Wagner (F)

This paper is an account of the winning and utilization of natural gas at Saint-Marcet in the south-west of France.

The bore holes have large producing capacities, and a small number of them would be sufficient to ensure the programme of 35×10^6 cu. ft. per day, which is planned for the near future. The rational development of the field, however, requires that a larger number of wells should be put into production so that the pressure is reduced uniformly throughout the field. The reserves of gas were originally of the order of 212×10^9 cu. ft., of which it was hoped to recover at least 160×10^9 cu. ft.

The method of winning and distributing the gas is described. Gas from the wells is brought to a main line 8.5 in. in diameter and 11 miles long, which operates at a pressure of 1,140 lb/sq. in. and carries 28×10^6 cu. ft. of gas per day to the natural gasoline plant at Boussens which was put into operation in 1949. At this plant the gas is scrubbed with gas-oil to remove the pentane and higher hydrocarbons, 90 per cent of the butane, and over 50 per cent of the propane. These hydrocarbons are recovered by distillation and separated by fractionation. These yields per day (i.e. per million cu. m. gas) are 15 tons propane, 21 tons butane, and 52 tons gasoline.

The scrubbed gas, which has a calorific value of the order of 967 Btu./cu. ft., is distributed through a long pipe line system having a maximum service pressure of 853 lb/sq. in., to a large number of consumption centres in the region Pau-Boussens-Toulouse-Bordeaux.

The gas has four main uses. Firstly, it is used as town's gas, mainly in admixture with coal gas or water gas, or after partial conversion of the methane to carbon monoxide and hydrogen, although 12 per cent of the natural gas used as town's gas is distributed in the pure state. Secondly, it is used for heating furnaces and boilers in cases where it not only leads to an appreciable increase in efficiency, but also results in a considerable saving in transport costs for the solid fuel replaced. Thirdly, it is used in the production of fertilizers by making methane the source of hydrogen for the production of synthetic ammonia. Fourthly, natural gas compressed to 2,845, or even 3,555 lb/sq. in. is used as a substitute for motor spirit.

By these uses of natural gas, France has been able to replace imported fuels to an appreciable extent. The saving in the import of coal rose from 200,000 tons in 1947 to 240,000 tons in 1948, and was expected to reach 420,000 tons in 1949. The saving in the import of motor spirit (by the use of compressed gas and the gasoline from the Boussens plant) for the same three years was 37,000, 56,000, and 82,000 tons.

Utilization of Natural Gas in the Poe Valley: Castellani (I)

The production of natural gas in Italy, which rose steadily from 460×10^6 cu. ft. in 1936 to $4,130 \times 10^6$ cu. ft. in 1948, showed a marked increase to $7,060 \times 10^6$ cu. ft. in 1949 with the exploitation of the Caviaga deposits in the Po valley. Two other deposits have been discovered at Ripalta and Cortemaggiore in the same district, and though these are, as yet, in the exploratory stage, they will, when fully developed, give greater yields than the Caviaga deposits. In a few years it is probable that the total production of natural gas in Italy will reach 70×10^6 cu. ft. a day.

Hitherto, the gas has been used mainly for steam-raising and steel making, and to a smaller extent, in the form of bottled gas, as a substitute for petrol. Utilization for such purposes is limited by transmis-

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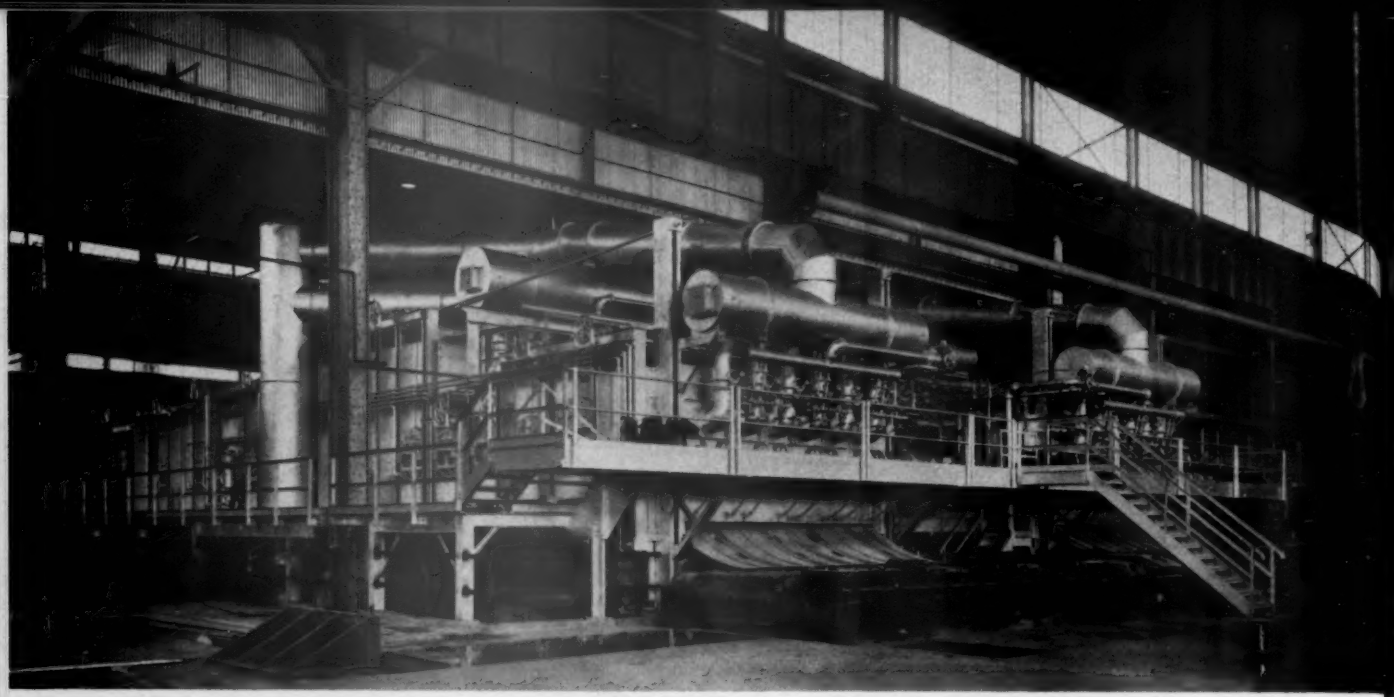
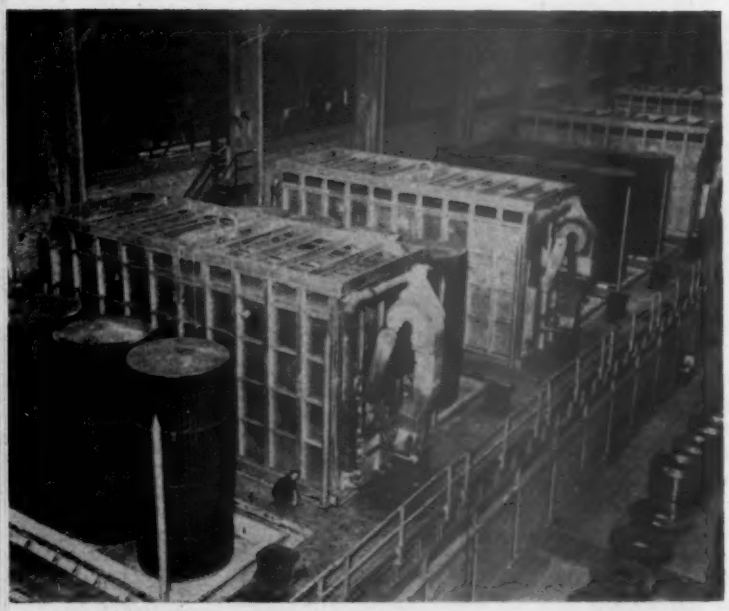




Left—Radiant tube fired coil annealing covers. Coils of steel are stacked on each base and then covered with one of the corrugated inner covers shown in foreground. The outer or heating cover is lowered over four inner covers and their contained coils. The outer or furnace cover is heated by gas-fired radiant tubes which isolate products of combustion.

Above—Modern Surface Combu recuperative type slab reheating nace installed in an Ohio stee is 80 ft. long by 18 ft. wide. fired by natural gas burners s ing across width of the fu both over and under the More than 4,000,000 lbs of slab reheated to approximately deg. F. for rolling every 24

INDUSTRIAL GAS FURNACES

by W. M. Hepburn

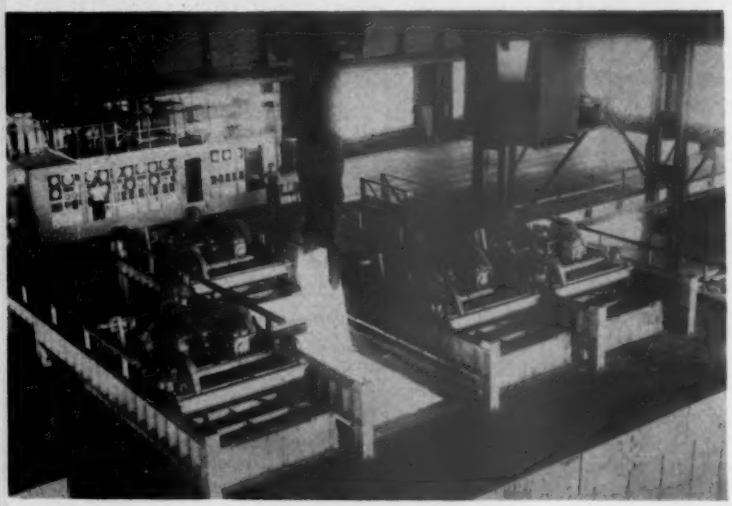
Vice-president, Surface Combustion Corp.

Toledo, Ohio

Present day utilization of gas fuels in industrial furnaces employs three general types of combustion: 1—a premix system in which air and gas are intimately mixed, producing a high speed of reaction and a non-luminous flame. 2—Diffusion combustion in which the flame is progressive, producing a heavy carbon breakdown with an ensuing long, luminous flame. 3—Various intermediate combinations of 1 and 2.

Combustion is not just a simple process represented by a simple chemical reaction. The mechanism of propagation of flame through a combustible mixture is in reality an exceedingly complex process depending upon a large number of factors, involving complicated reactions and the formation and reformation of active particle centers.

The problems of combustion are not confined to some particular new furnace development. They are the basic strata upon which the economic well being of this nation depends.



Left—Gas-fired soaking pit installation. A single burner is used to heat a charge of 12 or 16 ingots uniformly, each ingot weighing 5 tons or more, to a temperature around 2300 deg. F without washing and hold them at that temperature for hours, if necessary. This process is used to reheat the ingots after they have been stripped from the ingot molds and bring them to proper temperature for rolling.

State Compensation Insurance Protects Public Utility Companies

by Leo T. Parker

Attorney at Law, Cincinnati

RECENTLY an official of a gas corporation asked these questions: "Why do state compensation laws not *always* protect gas corporations against suits by injured employes? Can an employe who sustains an injury through his own fault receive damages from his employer and compensation under the State Workmen's Compensation Act? Can an injured employe receive compensation under the State Workmen's Compensation Act and also sue the gas company for damages? If an employe has accident insurance, can he still recover compensation for an injury?"

First, it is important to explain that an injured employe who carries accidental insurance may recover compensation or damages from a negligent employer, the same as one who has no insurance.

For example, in Carpenter v. Ford, 212 S. W. (2d) 984, it was shown that an employe of a gas company was seriously injured when a defective bushing and plug in an opening in a gas tank blew out while he was inspecting it. The employe sued the company for heavy damages.

During the trial the gas company's counsel asked the employe this question: "You carry an accident insurance policy?"

In subsequent litigation the higher court held that the employe could recover damages for injuries if the testimony proved that the injury resulted from negligence of the employer. The court also held that although the employe had accidental insurance, this fact did *not* affect his legal right to recover damages for the injury. The court said:

"Certainly the fact that the plaintiff was insured or not is immaterial to the controversy here. It could not affect plaintiff's (employe's) right of recovery."

Voluntary Risk

According to a recent higher court, an employe who assumes a risk voluntarily, and outside the scope of his employment, cannot receive compensation for an injury.

For example, in Peoples Gas Light & Coke Co. v. Industrial Commission, 89 N. E. (2d) 808, the testimony showed facts, as follows: One George had been employed by the Peoples Gas Light and Coke Co. for more than 22 years as a laborer working at various jobs, including running a machine, working on the conveyor belt, on a crane, as a fireman, mechanical helper, ditch cleaner and digger, pipelayer, welder, boiler cleaner, clinkerman and in other divers menial capacities.

One day he was directed by his foreman to assist the engineer in the subbasement. Upon finishing this job he did not report to his foreman, but upon his own *volition,* and without knowledge of his foreman, he climbed some 150 feet to the top of a cupola, which was the junction point of five different conveyor belts, *to clean up and carry away some dust that he found in the tower.* Here he loafed and gazed out of the window. At this time the belts were empty and not in operation. Finally the employe started the belts in operation and his hand was caught under a roller while he attempted to remove dirt from the belt. His calls for help were heard by another employe and by the foreman. The belts were stopped and his hand released from under the rollers. He sued for compensation under the State Workmen's Compensation Act.

During the trial the employe admitted that no one told him to clean the belts. Therefore, the higher court refused to award George compensation, and said:

"Any number of previous jobs performed by claimant (employe) in the process of cleaning the belts could in nowise give him the right or authority to put the belts in operation. This was strictly outside his scope of authority, express or implied, and in doing so he was a mere volunteer. In short, he was doing something he was not only not required to do but had no business doing."

On the other hand, all higher courts agree that an employe who sustains an injury *within* the scope of his employment may recover compensation under the State Workmen's Compensation Act, although the injury resulted from the employe's negligence.

An accident does *not* arise "within the scope of employment" when it occurs while the employe is doing something entirely different from his regular employment, or when he is on his way to work unless the employer furnishes transportation to the place of work. The fact that the employer pays part expenses of traveling to and from his regular place of employment does not result in the employe being "within the scope of the employment."

For illustration, in Hantke v. Harris, 54 Pac. 293, it was shown that an engineer of a gas plant was going to his work in his own automobile when he had an accident. It was contended that the gas company was liable because the testimony proved that it paid the engineer *part* of the expense of operating the automobile. However, the court held the company *not* liable.

Employment Scope

Here are several higher court decisions which illustrate when an employe *is* within the scope of his employment: Robertson v. Olson, 181 Minn. 240; Here the employe was riding in his employer's motor truck. Elliason v. Western, 202 N. W. 485; Here the employe was returning to his employer's plant in a truck furnished by the employer. Schmitt v. American, 42 S. W. (2d) 969; Here it was the duty of an employe to leave his home early and perform services for his employer before reporting to the employer's place of business.

The accident happened while the employe was traveling from his home to his employer's place of business. Kuehmichel, 145 N. W. 788; Here the employe was working outside the employer's plant but during the period covered by his employment. Auer, 103 N. J. Law, 372; Here the employe was authorized by the employer to use his own automobile, and his employer paid for the upkeep and running expenses of his car. Wilson, 134 A. 611; Here an employe was shot while returning from an errand authorized by his employer. White, 137

(Continued on page 42)

Index of Yields : Selected Utilities Stocks

	Aug. 1950	July 1950	June 1950	May 1950	Apr. 1950	Mar. 1950	Feb. 1950	Jan. 1950	Dec. 1949	Nov. 1949	Oct. 1949	Sept. 1949
Natural Gas Transmission Companies	5.46%	5.76%	4.86%	4.70%	4.77%	4.57%	4.83%	5.02%	4.75%	4.85%	5.15%	5.25%
Natural Gas Transmission & Distribution Companies	5.71	5.79	5.29	5.11	5.14	5.19	5.26	5.23	5.26	5.58	5.61	5.73
Manufactured & Mixed Gas Companies	5.55	5.76	4.98	4.66	4.77	4.71	4.75	4.62	4.75	4.94	5.07	5.16
Class "A" Electric Companies	5.59	5.64	4.94	5.13	5.24	5.15	5.38	5.40	5.48	5.49	5.53	5.58
Class "B" Electric Companies	6.35	6.41	5.58	5.30	5.37	5.42	5.37	5.47	5.68	5.77	5.96	5.72

Method of Compiling Index of Yields

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

The companies used in compiling this index are:

Natural Gas Transmission Companies: El Paso Natural Gas Co.; Northern Natural Gas Co.; Panhandle Eastern Pipe Line Co.; Southern Natural Gas Co.; Tennessee Gas Transmission Co.

Natural Gas Transmission and Distribution Companies: Columbia Gas System, Inc.; Consolidated Natural Gas Co.; Lone Star Gas Co.; Oklahoma Natural Gas Co.; Pacific Lighting Corp.

Manufactured and Mixed Gas Companies: Bridgeport Gas Light Co.; Brooklyn Union Gas Co.; United Gas Improvement Co.; Peoples Gas Light & Coke Co.

Class "A" Electric Companies: Boston Edison Co.; Commonwealth Edison Co.; Houston Lighting & Power Co.; Southern California Edison Co., Ltd.

Class "B" Electric Companies: Dayton Power & Light Co.; Hartford Electric Light Co.; Pennsylvania Power & Light Co.; Public Service Co. of Colorado; San Diego Gas & Electric Co.

THE creeping improvement which has taken place in market prices for public utility common stocks during recent weeks reflects a calmer and more calculated appraisal of the investment picture by investment firms and investors alike.

The realization has dawned that even in a war economy funds must find a haven for investment. The advisability of having all or the major portion of one's resources in cash at a time when the cost of living is rising is open to serious question.

Furthermore, it has been proved once again that careful analysis of the impact of an armament economy on an individual company's securities very often indicates a course of action as to purchase or sale wholly different from that which was suggested at first glance.

Utility equities have recovered only about one-fourth of the ground which they lost immediately following the outbreak of hostilities in Korea. But the advance of late has been fairly constant and it conceivably could carry much further in the event the Federal Government either does not resort to an excess profits tax or if it gives special consideration to utility companies in such excess profits tax bill as it might enact.

From the standpoint of corporate developments, the utility picture—especially in the natural gas classification—is all to the good. Earnings of leading pipe line companies are running far ahead of last year (in some cases nearly double) and will continue to improve as enlarged facilities make their contribution to capacity and to earnings. Dividend payments by these companies are aggregating on the average only about one-half of available earnings and no question arises as to maintenance of dividend payments.

In fact, increases in dividend payments by some of these companies are definitely in the cards and at a very early date.

Sharply rising oil prices again are paring margins of manufactured gas companies, but substantial savings are in prospect for most of these companies starting a few months hence when natural gas is introduced into the metropolitan New York area.

These companies will be better situated than other utilities from a tax standpoint in that they will be able to absorb without difficulty any increase in the present tax rate without having to await compensatory relief in the form of increased gas rates.

While no estimate has been made of the possible effect on gas industry earnings of a hike in Federal income tax rates to a 45 per cent level, it is significant that an impost of this amount would pare net earnings of the electric utility industry by only seven per cent on the basis of returns through June 30, last.

From the standpoint of corporate profits as a whole, the situation is just as reassuring. Present conservative estimates are that net earnings of American industry this year will be around $18 billion after taxes at the present rate. This would compare with $16.7 billion for 1949 and with the all-time high mark of $21.2 billion attained in 1948. Inflationary forces at play in the economic picture are such, however, that corporate profits this year might approximate the 1949 level even if Federal taxes are raised to 45 per cent.

BACKLOG OF NEW ISSUES IS BEGINNING TO BUILD UP

John F. Falvey

ALL indications now point to a heavy volume of corporate securities coming to market during the late summer and early fall. This is an encouraging sign after the practical dearth of new security issues which existed during most of the summer.

Following the $1,115 million total of new bond issues brought to market by utility companies alone in the six months ended June 30, last, new corporate offerings in July fell to the extremely low level of about $64.5 million.

Columbia Gas System, Inc., tested the market on August 1 with its offering of $90 million of new bonds and did well, disposing of the issue on a 2.895 per cent interest cost basis. Although the market had not sufficiently recovered from the sinking spell which followed our Korean incursion to permit complete digestion of the issue at the original offering price of 102.308 per cent for 3s, a reduction in the price to the 102⅛—¼ per cent level cleaned the issue from the under-

(Continued on page 45)

To Meet Competition's Challenge

THE gloves are off in the competition for public preference. How are you meeting the challenge?

The best answer to competition is a fully informed, confident personnel—fully informed on the newest techniques and developments, methods and appliances, processes and equipment that make Gas the finest service money can buy. *To be sure your personnel is fully informed*

Send them to the

A.G.A. Convention and G.A.M.A. Exposition

Atlantic City

OCT. 2-6

THE GAS INDUSTRY'S MID-CENTURY PAGEANT OF PROGRESS

Here they can participate in a timely and constructive program that will discuss every phase of the manufacture, distribution and sale of Gas. Here, under one roof, they can see a complete exhibit of the most modern home appliances, machinery and methods.

Here they can discuss their own problems with the keenest minds in the Industry.

Send your personnel to Atlantic City, Oct. 2-6 and you'll be sure to meet competition's challenge to *you* with a fully informed, an inspired, a *confident* organization.

GAS APPLIANCE MANUFACTURERS ASSOCIATION, INC.

Chief Topic of PCGA Meeting At Seattle Is Possibility of Natural Gas

President
N. Henry Gellert

President-Elect
E. G. Lawson

Vice-pres.-Elect
W. M. Jacobs

Natural gas-hungry Pacific Northwest will have first call on the prolific Alberta reserves once it is determined that there is a sufficient supply to take care of all the needs of the Canadian provinces for the next 50 years.

This was the cheering word that the Honorable Ernest C. Manning, Premier of the Province of Alberta, brought to the 57th Annual Convention of the Pacific Coast Gas Association, held in Seattle July 31 to August 3. The preoccupation of gas men in the Pacific Northwest with the problem of securing a supply of natural gas was the dominant note in this year's program.

The delegates to the convention held their first gathering in the Spanish ballroom of the Olympic Hotel on Monday evening, July 31. The only program in connection with this meeting, other than a dinner and a word of welcome from President N. Henry Gellert, was the presentation of a playlet entitled "Paradise Lost, Paradise Regained" by Miss Macine Howe, Southern California Gas Co., W. Darrell Milton, Southern Counties Gas Co., and W. Q. Kringle, Southern California Gas Co.

N. Henry Gellert, President of the Association, opened the first general session on Tuesday morning with an address that departed from the customary opening address of association presidents. President Gellert's theme was the foreign policy of the United States, in view of the Korean war crisis. Mr. Gellert gave assurance that the gas industry is ready to give whole-hearted support in the present crisis.

However, he declared that as American citizens who have made important contributions to the nation's welfare and security, gas industry leaders have a right to speak out. In this emergency, he said, we have a right to ask the President of the United States to do the following five things:

1) Dismiss all past and present Communists,
2) Rid the government of wasteful agencies and unnecessary personnel,
3) Reestablish the historic American foreign policy based on the Monroe Doctrine,
4) Refuse to recognize the *status quo* of satellite nations such as have been established in China,
5) Establish a strong Army, Navy and Air Force capable of backing up our foreign commitments.

Following President Gellert's address, the chairmen of the various association sections gave their annual reports. Those who gave reports were John E. Wolf, Pacific Public Service Co., San Francisco, chairman of the Accounting Section; C. A. Gabriel, Monarch Heating Co., Los Angeles, chairman of the Manufacturing Section; J. L. Hall, Southern California Gas Co., chairman of the Sales Section; and R. W. Todd, chief engineer at Pacific Lighting Gas Supply Co., chairman of the Technical Section.

Officers Elected

Ernest G. Lawson, President of the Pacific Public Service Co. of San Francisco, was elected President; W. M. Jacobs, vice-president of Southern California Gas Co., was elected vice-president; and Harry McGann, auditor of Pacific Gas & Electric Co., was elected treasurer to replace David G. Martin who is retiring after 26 years as treasurer of the association.

In addition two new directors were elected for two-year terms: W. J. Bailey, Jr., vice-president of Affiliated Gas Equipment Manufacturing, and Frank B. Wright, vice-president of Southern California Gas Co. in Los Angeles. C. H. Gueffroy, President of the Portland Gas & Coke Co. and J. S. Moulton, vice-president of Pacific Gas & Electric Co., were reelected to the board.

The morning session wound up with two addresses by representatives of eastern gas association affiliates. Hugh Cuttrell, President of the American Gas Association, brought a message from New York, while Stanley B. Hobson, President of Gas Appliance Manufacturers Association, gave a summary of the gas appliance manufacturing picture.

Premier Mannings' address took place at the Tuesday noon luncheon in the Spanish ballroom at the Olympic Hotel. The present natural gas supply situation in the province, the Premier declared, is this:

It is now quite clearly established that there is between three and six trillion cubic feet of natural gas blocked out in the Alberta producing area. The government's immediate concern is to see that the natural gas requirements of the province are adequately taken care of for a period of at least 50 years in the future. Once that is established, the provincial government must give preference to demands from other Canadian gas users who are able to use the supply. Then the government, as a matter of policy, is in favor of the export of gas anywhere that a market can be found. Certainly, the Premier said, the Pacific Northwest is the most logical area.

At present, a provincial conservation committee, empowered to investigate and recommend a course of action insofar as the gas supply is concerned, has under investigation the petitions of no less than four companies to tap the fields in the producing area. How much longer this committee would require to complete its hearings and reach a decision, the Premier would not undertake to say. But he did assure delegates to the convention that the provincial government was aware of the urgency of the situation in the Northwest and was making every effort to reach an early conclusion.

Charles H. Gueffroy, President of the Portland Gas & Coke Co., presided at the general session which opened at 2:30 on Tuesday afternoon.

The first speaker was Henry K. Wrench, President of the Minneapolis Gas Co., who told how his company built its natural gas sales. The Minneapolis company made its conversion to straight natural gas service in 1947. An immediate problem which confronted the company was brought about by the limited availability of gas for house heating. The company in consultation with various public bodies decided to choose applications by lot. All the applications received were put through an IBM machine at random, and punched in the order in which they went through the machine. Thereafter, when additional gas heating service became available, those to receive the

(Continued on page 44)

two spurs

gas range dealers'

for Universal

fall sales

UNIVERSAL'S OLD STOVE ROUNDUP PACKAGE will again give Universal dealers the most powerful *brand* promotion in the industry. Closely coordinated with AGA's fall campaign, Universal's program will help focus national attention on Roundup Time. But when the actual *branding* begins, Universal's big *separate* package of advertising materials, display aids and merchandising ideas will give Universal dealers powerful help in pulling *sales* into their own corrals.

UNIVERSAL'S OLD STOVE CONTEST is another sure bet to stir up fall sales action. Dealers will be supplied with complete contest instructions, entry blanks, and advertising materials in Universal's second big Roundup package. And if they use 'em the way they did last year, they're a cinch to break every record in the salesbook for wrangling customers and bulldogging profits!

These two practical programs, designed to help Universal dealers spur *more* sales action out of the industry's Roundup program, are typical of the many advantages offered by the Universal franchise. Due to expanded manufacturing facilities, a limited number of these valuable franchises are now available in certain localities. For complete information about *your* opportunity, write the makers of America's most complete line of fine gas ranges.

over 26 million people are being branded by Universal advertising in

LIFE

See us at the G A M A Exhibit
During the A.G.A. Convention
Space 512—Oct. 2nd to 6th

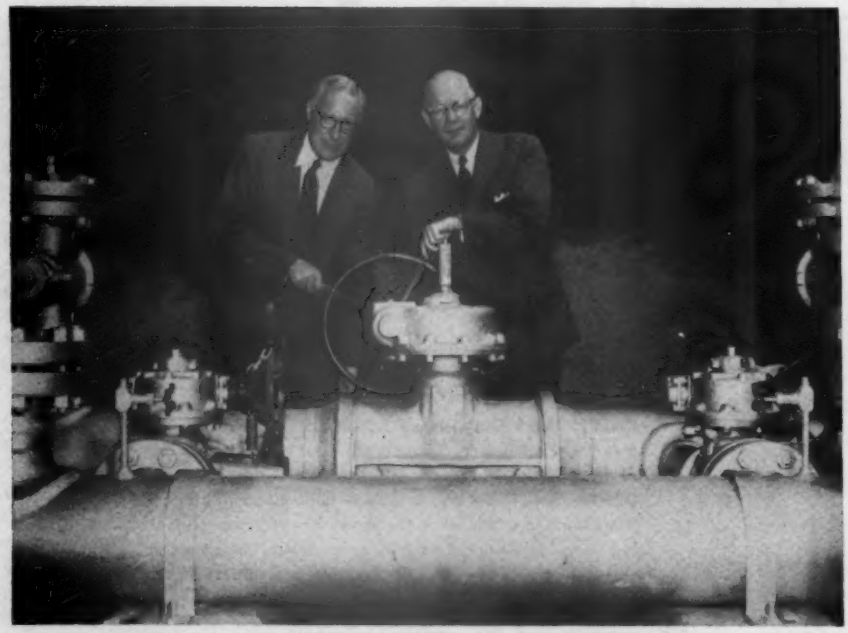
CRIBBEN & SEXTON

Universal

GAS RANGE

CRIBBEN & SEXTON CO., 700 NORTH SACRAMENTO BOULEVARD, CHICAGO 12, ILLINOIS

News of the Gas Industry



EASTWARD HO—First natural gas for Mid-Hudson Valley was turned on early in August near Newburgh by Ernest R. Acker, (left) President of Central Hudson Gas & Electric Corp., and George S. Young, (right) executive vice-president of Columbia Gas System, Inc.

United Gas Pipe Line Plans $111,510,000 Project

United Gas Pipe Line Co., Shreveport, has applied to the Federal Power Commission for authorization to expand its natural gas transmission system by constructing 1,005 miles of new pipe line in Texas, Louisiana and Mississippi. Estimated cost is $111,510,000.

The construction program is part of a plan to construct eventually about 1,130 miles of line, the application says, in order to meet increasing demands of the company's present customers and to serve new customers. United said the new facilities would serve the triple purpose of increasing the flexibility of its system, making available new and substantial additional natural gas reserves, and providing a more balanced distribution of presently connected reserves.

The company plans to build approximately 451.3 miles of 30 inch, 5.8 miles of 26 inch, and 53.4 miles of 24 inch line extending from the Agua Dulce Field in south Texas to the Monroe, La., area. This line would have a delivery capacity of approximately 415 million cu. ft. of gas per day.

The project also includes construction of 211.9 miles of 30 inch, 13.4 miles of 26 inch, 3.7 miles of 24 inch, and 15.5 miles of 20 inch line extending from the Pure Oil Company's offshore platform off the coast of Louisiana to United's Jackson, Miss., compressor station. In addition, the company would build about 215 miles of line connecting the proposed 30 inch line with various producing areas and extending to a delivery point with Texas Eastern's facilities near Kosciusko, Miss. These pipe lines would have a delivery capacity of about 390 million cu. ft. per day at the Kosciusko delivery point.

FPC To Discuss Amendment To Competitive Bidding

The Federal Power Commission has scheduled oral argument for September 22 in Washington on the question of further amending its new competitive bidding rule for public utility security issues, to increase from five to ten years the maximum term of loans by commercial banks and certain other institutions which are excepted from competitive bidding requirements.

AGA Issues New Edition of 'Gas Facts'

Comprehensive tables of gas utility securities and tabulations of fuels and electric energy consumption by industrial establishments are features of the new issue of *Gas Facts* just published by the bureau of statistics of the American Gas Association.

The annual volume includes pertinent information to operating and financial developments within the industry. It includes data relating to natural gas reserves, production of the several types of gas, customers, sales and revenue trends as well as information relating to security issues, construction expenditures, composite balance sheets and income accounts for straight and combination utilities, miles of main and labor.

During the past year the Association sponsored jointly with the American Petroleum Institute and the Bituminous Coal Institute a special tabulation of fuels and electric energy consumption by industrial establishments as gathered by the US Bureau of the Census. This survey presents the quantity and cost of principal fuels used separately by industry groups in each of the 48 states. Several summary tables from the report have been prepared and are included.

The Bureau of Statistics also has summarized and published detailed operating expense information in the form of operating expense ratios indicating production cost per Mcf., sales promotion cost per customer, total operating expense per Mcf., and other similar material. This material segregated by type of gas company is shown in nine new tables covering the years 1947-1948.

Copies may be obtained from the AGA bureau of statistics at a price of $1.00 per copy.

Rita McIntyre Is Home Economist In Cumberland Area

Miss Rita McIntyre has been named home economist for the Cumberland and Allegheny Gas Co.

Miss McIntyre, a native of Pittsburgh, received her degree in home economics from Mt. Mercy College.

For the past year she has been home economist at the Washington, Pa., office of the Manufacturers Light and Heat Co., an associated company in the Pittsburgh group of The Columbia Gas System.

Consolidated Natural Gas Awards 3 Scholarships

Three Chicago area high school graduates have been awarded four year scholarships in chemical engineering to Illinois Institute of Technology. The awards were granted by the Consolidated Natural Gas Systems Educational Foundation of Cleveland, and cover full tuition, fees, and books.

Winners, selected on the basis of high school records and results of competitive examinations, are: Ralph G. Zelmer, Tilden high school; Gerald J. Robertson, Lake Forest high school; Daniel O'Rourke, St. Mel high school.

George E. Welker Retires After Forty Years

George E. Welker, President of United Natural Gas, Ridgway Gas, St. Mary's Natural Gas, Smethport Natural Gas, Mercer County Gas, The Mars Co. and The Sylvania Corp., all located in Oil City, Pa., has resigned his offices. He will, however, continue to serve as a director and in an advisory capacity for a few months.

Mr. Welker has been active in both local and national gas matters. Locally he began his career 40 years ago in the employ of the United Fuel Gas Co. of Charleston as a civil engineer and geologist. In 1918 he became chief civil engineer and geologist for United Natural Gas Co. and at the same time carried on considerable consulting engineering work. In 1924 he was elected vice-president of United Natural Gas and director of The Mars Co. and later became President of the other natural gas companies.

Nationally he served for many years on the advisory committee and for one year as national chairman of the natural gas department of the American Gas Association. During World War II he served on the Petroleum Industry War Council.

Howard Rose Succeeds Welker As Head of Oil City Group

Howard S. Rose, of Oil City, has been elected President of United Natural Gas, Ridgeway Natural Gas, St. Marys Natural Gas, Smethport Natural Gas, Mercer County Gas, The Mars Co. and The Sylvania Corp. He succeeds Geo. E. Welker, who resigned.

In 1903 Mr. Rose entered the employ of National Fuel Gas. Later he was transferred to Oil City when the main office of United Natural, a subsidiary of National Fuel, was moved there. In 1920 he was elected to the boards of directors of United Natural and other companies associated with it and in 1927 was elected secretary and treasurer.

M. J. Talley has been elected to succeed Mr. Rose as secretary and treasurer. In 1917 he entered the employ of United Natural and associated companies and since that time has served in the accounting department and as assistant secretary and assistant treasurer.

Michigan Consolidated Gas Promotes Paulin to V-P

Roland R. Paulin has been promoted to vice-president and assistant engineer of the Michigan Consolidated Gas Co., Detroit, Henry Fink, President, has announced.

Mr. Paulin has been assistant manager of operations for the past year, and for five years previously was commercial office manager. He has been with the company for 24 years, having started as a cadet engineer in the manufacturing department immediately upon graduation from Purdue University in 1926 as a chemical engineer.

Mr. Paulin has served at various times as general foreman of the manufacturing department, as a heating engineer and assistant to the sales manager, and as supervisor of the industrial sales department.

Servel Promotes Ray Cooper To Oklahoma Manager

Ray Cooper, of Dallas, has been promoted to district sales manager for the state of Oklahoma by Servel, Inc. He has been with Servel since his separation from the Army Air Force in 1946.

In addition to the Blast Gate Valves pictured, of which there are other sizes, GASMACO manufactures all-iron "cone disc" double-gate valves, hand or hydraulically operated; butterfly valves, angle valves, hot valves, explosion check valves, steam and gas reversing valves, stack valves, and many other types.

GASMACO has everything for the gas plant . . . engineering, equipment, construction. Check these against your requirements: Continuous Gas Generation . . . Regenerative Oil Gas Sets . . . Gas Scrubbers and Condensers . . . Single and Twin Generator Oil Gas Sets . . . Gas Purifiers . . . Blue Gas and Carbureted Water Gas Sets.

Contact GASMACO engineers today for expert service regarding your needs.

THE GAS MACHINERY COMPANY
16114 WATERLOO ROAD
CLEVELAND 10, OHIO

Designers, Fabricators, Erectors
Gas Plant Equipment and
Industrial Furnaces

E. C. McGraw Elected V-P Of Transcontinental

E. C. McGraw

Transcontinental Gas Pipe Line Corp. has announced the election of E. Clyde McGraw as vice-president in charge of operations.

Mr. McGraw has resigned as vice-president of Stone and Webster Service, as President of Montaup Electric, and as vice-president of Tampa Electric to assume his new duties.

Since graduating in engineering from the University of Nebraska, Mr. McGraw has had a diversified career in public utility construction and operation.

Three Research Men Promoted By Koppers Company

The appointments of Dr. E. W. Volkmann and Dr. F. L. Jones as assistant managers of the research department of Koppers Co. was announced by Dr. D'Alelio, vice-president and manager of the research department. Dr. Volkmann will head the laboratory and development sections and Dr. Jones will supervise the research administration and patents sections.

Dr. Volkmann, a native of Germany, was graduated from the University of Koenigsberg with a degree in mechanical engineering in 1924. He then came to the United States to receive his Doctors degree at Columbia. He has been associated with Koppers since 1926.

Dr. Jones was graduated from Bucknell University in chemical engineering and received his doctor degree from Columbia. He taught at Columbia and later became director of chemical research for Bausch and Lomb Optical Co. in 1940. He joined Koppers in 1948 as business manager of the research department.

Dr. W. J. Monacelli has been named manager of the patents section.

Southern Union Names Schrodt As Sales Coordinator

Allen D. Schrodt, of Dallas, has been named sales coordinator in charge of the merchandise sales division, a new department of Southern Union Gas Co., according to an announcement by C. H. Zachry, President.

Creation of the new department, Mr. Zachry said, resulted from the recent expansion of Southern Union, which through merger, purchase, and growth added 85,000 new customers last year.

Merchandise sales heretofore were handled by Southern Union's purchasing department, in which Mr. Schrodt served as assistant purchasing agent two years. Since July 1948, he has headed the company's land and lease department.

Brooklyn Union Gas Names Foster Vice-President

Glen E. Foster was elected vice-president of The Brooklyn Union Gas Co. on July 26.

Mr. Foster joined Brooklyn Union in 1933 as an assistant auditor, having previously been engaged in public accounting with the firm of Arthur Andersen and Co. In 1937 he was elected comptroller and in December, 1945 he was made an assistant vice-president.

W. G. Wiegel Elected Treasurer Of Lone Star Gas Co.

The election of Willard G. Wiegel as treasurer of Lone Star Gas Co. to succeed H. G. Cornatzar, who retired under the company's pension-insurance program after more than 33 years of service, has been announced by President D. A. Hulcy. Taking over his new duties August 1, Mr. Wiegel retained his position as director of personnel to which he was appointed in 1942.

Mr. Wiegel joined Lone Star in 1928 in the capacity of special representative during an expansion program, and two years later he was appointed advertising manager. He served in that capacity until his appointment as personnel director.

Mr. Wiegel is past President of the Dallas Advertising League and received its most valuable member award in 1937. In 1948 he was chairman of the American Gas Association's Southwest Personnel Conference.

Mr. Cornatzar, the retiring treasurer, joined Lone Star in 1917 as a bookkeeper. He became the company's first traveling auditor. In 1942 he was named treasurer.

Michigan-Wisconsin Pipe Line To Add Compressors

Michigan-Wisconsin Pipe Line Co. expects to have in operation by the forthcoming year-end the additional compressors to lift capacity to 110.6 billion cu. ft. a year, from 56.5 billion ft. at present, according to William G. Woolfolk, chairman of the parent American Natural Gas Co.

"The completion of this second stage will not fully exhaust the capacity of the pipe line itself which was designed and built for an ultimate capacity of about 135 billion cu. ft. of sales," Mr. Woolfolk said. "To attain this ultimate capacity we will need additional pumps and more gas reserves. We are on the alert to procure additional reserves.

"Whether steel and other construction material will be available to meet the construction program of our local distributing companies in 1951 cannot presently be foretold," he added. "War necessities may force sharp curtailment through Governmental priorities."

Mr. Woolfolk estimated system construction needs at about $100 million in 1950 and 1951.

American Meter Names Gribbel As District Sales Manager

John Gribbel

The American Meter Co. recently announced the appointment of John Gribbel, 2nd, as district sales manager for the Philadelphia sales territory.

Mr. Gribbel was graduated from Yale University in 1938. Following graduation he was employed by the Philadelphia Electric Co. as a cadet engineer, and remained with that company until February 1941, at which time he went on active duty with the US Navy.

Mr. Gribbel has been employed by the American Meter Co. since March 1947 as sales engineer in Philadelphia. He is a director of the Tampa Gas Co.

Manufacturers Light and Heat Promotes Three Men

Several changes in personnel within the gas distribution department of The Manufacturers Light and Heat Co. have been announced by G. E. Wilson, superintendent of gas distribution.

Ira D. Findley, for the last two years local manager of gas distribution offices in Beaver Falls, New Brighton and Rochester, Pa., has become an industrial engineer. Mr. Findley succeeds Joseph Baggs, recently resigned.

Paul K. Kuzma is now local manager in the Beaver Falls, New Brighton and Rochester areas. Mr. Kuzma joined the gas company in September 1947, as a district engineer for the last three years with headquarters in the company's Bellevue office in Pittsburgh.

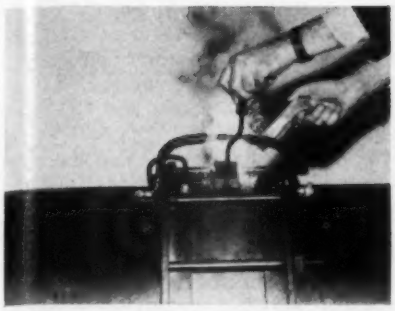
Paul M. Allen, Jr., succeeds Mr. Kuzma. Mr. Allen has been an engineer in the gas distribution department since 1948.

'Five Seconds of Silence' Wins Award as Radio Spot

The Advertising Association of the West recently selected the Portland Gas & Coke Co. spot radio announcement as best entry from cities over 100,000.

The radio commercial award, made at the 47th annual convention of the Advertising Association of the West in Los Angeles, was for a one-minute announcement featuring "five seconds of silence" to sell the silence of gas refrigeration.

A Portland radio columnist, speaking of the award for "broadcasting silence," quipped: "It was only five seconds of silence, to be sure, but we see in this a great trend toward silent commercials of the future."



Dresser Mfg. Div. Brings Out New Bonding Kit

Dresser Manufacturing Division, Bradford, Pa. announces the introduction of a new bonding kit, "Dresser-Bond," which simplifies bonding of mechanical couplings on steel pipe lines. The kit, consisting of 50 preformed bonds, welders, flint gun, flash powder, metal discs and coating compound for completing 50 bonds, employs a 5-second chemical welding method that any ordinary workman can use.

The resistance of the bond is said to be low and it retains its superior bonding properties permanently because (1) a homogeneous weld area is attained and (2) all surface control variables are eliminated. Over-all cost savings are estimated as being as high as 50 per cent over other bonding methods.

Georgia Natural Proposes Line To Serve Georgia & Florida

Georgia Natural Gas Co. of Albany, has filed a new application with the Federal Power Commission proposing to construct a pipe line system to serve natural gas markets in southwestern Georgia and Tallahassee.

The application, similar to one filed by the company in March and subsequently withdrawn, also asks the FPC to direct Southern Natural Gas, of Birmingham, Ala., to provide and sell to Georgia Natural an adequate supply of natural gas for the proposed project.

Georgia Natural estimates its annual demand at 9,167,098,000 cu.ft., with an estimated maximum day, firm, of 30,000,000 cu.ft.

New Rockwell Bulletin Is Issued

A twelve page technical bulletin on the new Rockwell instrument pressure control system has just been printed. The operation of the system is shown by a sectioned photograph with inlet pressure, outlet pressure and loading pressure gas depicted in colors. The application of this control system to either new high pressure balanced valve regulators or to those already in the field is described. Complete installation instructions are given including directions for its use to control either inlet or outlet pressures.

To obtain a copy of this bulletin write Pittsburgh Equitable Meter Division, Rockwell Manufacturing Co., Pittsburgh 8, for Bulletin 1080.

Orlo Brown Joins Staff Of Robertshaw-Fulton

Robertshaw-Fulton Controls Co. announces the addition of Orlo E. Brown, Jr., research metallurgist, to the staff of its west coast research and development laboratory, Los Angeles.

Mr. Brown has served as metallurgist with A. O. Smith Corp. and as development engineer with Globe-Union, Inc. He also served as chief metallurgist of Lockheed Aircraft Plant "A", and Western Gear Works.

He was professor of metallurgy in the department of chemical and metallurgical engineering at West Virginia University and now is a regular member of the extension faculty of the University of California at Los Angeles.

Carl E. Baird to Manage Division of Blaw-Knox

Carl E. Baird has been appointed manager of the Tulsa office of the Chemical Plants Division of Blaw-Knox Co. Mr. Baird has been with Blaw-Knox since 1946.

He is a graduate of the University of Oklahoma and has had 10 years of engineering experience in the fields served by the Tulsa office.

for over 25 years
WORKING WITH THE GAS INDUSTRY

Gas men know CLEVELANDS mean dependable scheduling and dependable performance because CLEVELAND engineering has kept pace with gas trenching problems. Compact design and hairline controls solve the problems of crowding city obstructions. Full-crawler mounting with smooth pads protects walks and lawns. CLEVELANDS ruggedness sets you up for the toughest off-season digging, while CLEVELANDS mobility and built-in higher capacity guard close deadlines on short, scattered jobs. Write today for details or see your local distributor.

Baby Digger "92" loads on or off its tilt-bed "T-5" trailer in 5 minutes flat.

See "CLEVELAND" at A. G. A. CONVENTION
Atlantic City, Booths 713-714
Also at "The Ambassador" Rooms 409-412

THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

LOAD BALANCING

(Continued from page 20)

Pioneered by Carrier in 1902, the industry has grown until since the war annual sales have been in excess of $250,000,000. The wide acceptance in recent years of air-conditioning for comfort purposes has brought it forcibly to public attention; yet its original and basic service was in industry, where the nature of the processes or materials used were such that controlled atmospheric conditions were essential to any year round uniformity in the finished products. Virtually all of the early installations and the great majority of all air-conditioning equipment now operating are based on the electricity driven compressor type of refrigeration unit.

Due principally to the pioneering work of Servel, which has been going on continuously in this field since 1933, the absorption type of gas-fired air-conditioner has now been reduced to an assembly line production basis, and made available in units as small as three tons, which are suitable for small commercial and domestic installations.

Before the war Servel had built 438 units in three and five ton sizes, of which 281 were installed on gas company lines in 24 different states. Since the war over 7,000 additional units have been placed in operation in practically every state and in several foreign countries.

In June of this year this manufacturer inaugurated a series of meetings throughout the country for the purpose of introducing its advertising and promotion drive behind the single unit, year round air-conditioning package that is now on the market and in quantity production at the plant, where a capacity of 10,000 units per year has been provided for.

As is true in all types of major appliances, ample sales helps are available from the manufacturer, from documented case histories of gas company experience, and from market studies that have been made of the potential volume in this type of equipment.

As a qualitative offset to winter heating peaks, gas-fired summer air-conditioning is unchallenged. Studying it from a quantitative viewpoint, with particular reference to its season load balancing possibilities, it is obvious that it will vary with relation to the climate in the areas or regions that are to be considered. In localities where a high number of degree days are encountered, there is a tendency for the summer air-conditioning peak to lag behind the winter heating peak in gas consumed. In warmer climates the reverse is true.

In installations in the Texas Gulf Coast area, according to Frank C. Smith, "the Servel unit uses 86.1 per cent of the average total household load, and of that portion of gas it uses, 70 per cent is consumed in the heating season, and comprises 60 per cent of the total gas load. Boston would seem to offer nearly the opposite extreme. There, where house heating is 72 per cent of the annual average residential gas load [per installation] the Servel air-conditioner utilizes 90 per cent of the gas consumption, with 18 per cent used in summer cooling."

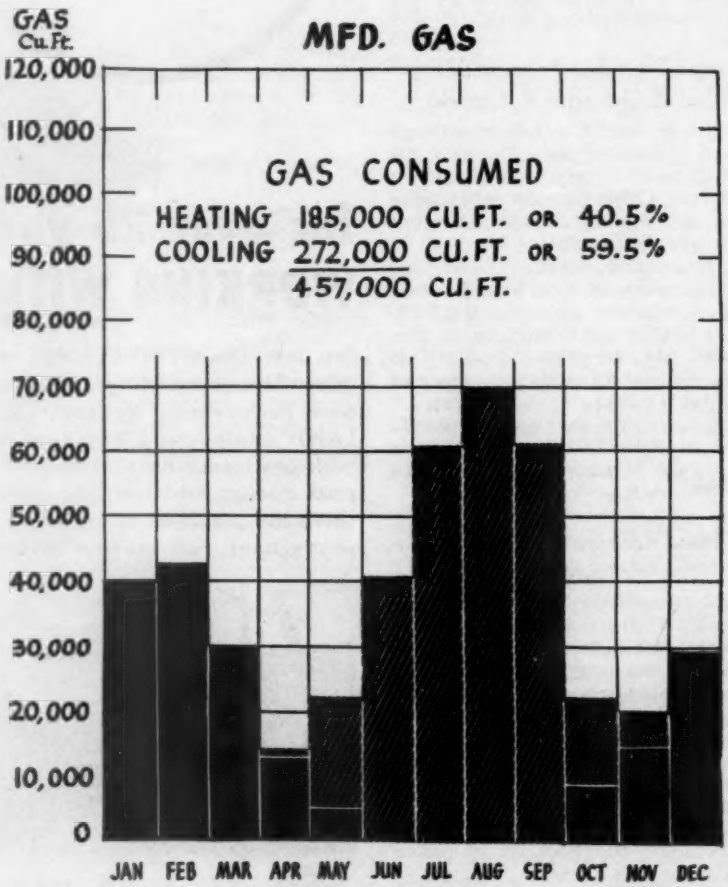
Other figures from various cities, and in homes where these units are installed are, on the authority of Mr. Smith, as follows: In Washington, D. C., the cooling load in a typical residence is 26.5 per cent of the total annual average for all household gas uses; in Pittsburgh 22.9 per cent; Kansas City 27.6 per cent; Cincinnati 25 per cent; Chicago 19.6 per cent, and Los Angeles 54.4 per cent.

As attractive as the ultimate market for residential air condition is, however, it is necessary to recall that it is only now emerging from the strictly luxury class. The householder who would firmly shun any restaurant that did not have summer cooling is still resigned to accepting whatever nature elects to dispense in the way of summer discomfort in his home.

This gap between cost and ability or willingness to pay is being closed. Before 1949 it was generally conceded that only homes in the class of $25,000 and up were likely prospects for year round air-conditioning. Servel believes that with units selling as low as $5,000 installed —which includes both the heating and cooling plant—the market now begins at the $15,000-priced home level.

The full impact of summer air-conditioning as a load balancer for house heating, however, is not at present greatest in the field of domestic cooling installations, as great as that potential may ultimately be. And certainly, since a five ton unit consumes on the average of one therm of gas for every hour it is in operation, that potential cannot be ignored.

A study of consumption figures of typical five ton commercial installations in the northeastern section of the United States is illuminating not only from the standpoint of gas consumed during the year, but most particularly with respect to the value of the equipment as an offset for winter peaks that may be occasioned

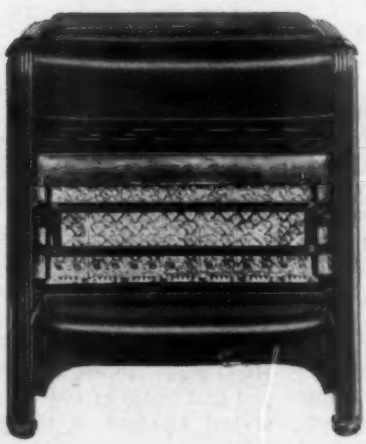


The average gas consumption for summer cooling and winter heating of four retail stores and one candy company in Massachusetts, New York and New Jersey, show an August peak 28 Mcf in excess of February.

ON HIGH PRICED GAS
ADAMS Cheerfulators can do an AMAZING JOB in CUTTING CUSTOMERS HEATING COSTS

They can serve most usefully to develop off-peak loads that will grow steadily in popularity.

Cheerfulators operate at a gas consuming rate of 220 B.t.u., per degree day, per 1,000 B.t.u. of calculated hourly heat loss and are fully vented. Average gas consumption for heating is double that rate.



These statements have been proven in many years of satisfactory service. We invite inquiries and careful discussion of engineering facts.

ADAMS BROS. MFG. CO., INC.
Established 1898

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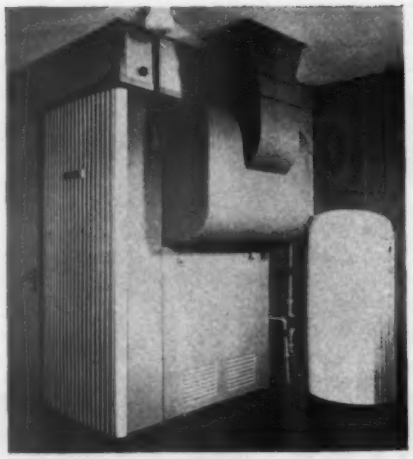
by domestic heating installations where no air conditioning is included.

The average monthly consumption of these installations is shown on the chart (above). It will be noted that where gas was used for both heating and cooling in this climate of from 5,000 to 5,500 degree days the peak occurred in the summer months of July, August and September, with heating utilizing only 40.5 per cent of the annual consumption.

A unique feature of air-conditioning, from the competitive standpoint, is that it appears destined to become less and less a desirable new load for the electric industry. In many areas where heavy loads of commercial cooling have been connected, serious summer peaks have already developed. A recent study by Ebasco develops the theme that an electric utility can make more return on its investment in generating capacity, through the sale of current for operating the controls and blowers of absorption type installations, than with electrically operated compressor type units.

It has been amply demonstrated that where the proper sales effort is put behind air-conditioning, it can be sold in volume. It is said that gas is now doing one third of the summer air-conditioning in Texas and in Southern California despite a head start of many years enjoyed by the electric industry. In 1949 the Springfield, Mass., Gas Light Co. was able to sell 20 per cent of all new air-conditioning installed in its area for operation with manufactured gas.



A packaged load balancer: The Servel year round air-conditioning unit.

Every gas utility contemplating an expansion of its house heating program would do well to estimate in advance exactly how much installed summer cooling would be required to raise the August valley to the February peak sendout, and settle for nothing less than 100 per cent of that quota.

Engineered Space Heating Controls Peaks

No discussion of heating, viewed from the standpoint of load balancing, would be complete without consideration of the role that can and should be played by zone or space heating equipment.

Space heating, as distinguished from central heating, has two outstanding possibilities. First, it can be sold as auxiliary heating, to supplement the central heating plant, regardless of the fuel that the latter may use; and second, where properly engineered so that installed capacity is in relation to the heat requirements of each zone, it can accomplish the entire house heating job with less fuel consumption, and consequently less peak demand, than an over-sized quick recovery central system.

Considered as auxiliary or off-peak space heating equipment, installations of this kind have a very desirable potential if properly sized for the job, and with due regard for the load factor that is to be accomplished.

Throughout the entire Eastern area there are many furnaces fired by anthracite, coke or oil. These homes could be sold efficient, fully vented, fully automatic gas heating units for auxiliary heating that would operate at lower costs than the furnaces during mild weather periods and for spring and fall heating.

In such dwellings, when severe cold starts, the auxiliary unit would be insufficient, necessitating firing of the furnace. As furnace heat brought the house up to normal temperature, the auxiliary unit would automatically close down.

The most practical approach to this is to sell relatively low input equipment the capacity of which will be insufficient to heat the house on the coldest days. In addition to this, such equipment should be thermostatically controlled not only to promote customer comfort during the spring and fall months, but also to automatically reduce the gas load during peak days when the main heating unit is operating at capacity.

Practically every home now using hand fired coal installations could well use at least one such space heater in the living room, where its gas consumption would be almost entirely an off-peak load.

This type of load has always been a large factor in gas sales in older natural gas districts of the North, where coal was the prevailing furnace fuel. It has proved a substantial, profitable load, practically free of peak day heating complications.

A very effective approach to the control of peak househeating demand, especially hourly peaks, can be accomplished through properly sizing the equipment. With a system of zone heating and firing, such as is now being successfully advocated and sold by several reputable manufacturers, jobs can be engineered so as to provide adequate customer comfort without extremely fast warm up, thereby reducing the hourly peak demand.

One of the advantages of gas over solid fuels is that it can be burned economically and safely in small units located in or close to the living areas where heat is actually required. With the trend toward smaller houses, and houses without basements, this exclusive characteristic of gas should be exploited to its utmost by the gas industry.

A comparatively new appliance on the market, designed largely for zone heating, utilizes a patented gravity convector that permits venting without the use of a stack or chimney. The convector is recessed in an outside wall behind the heating unit. It draws air for combustion and venting from outside the building and vents the products of combustion directly outside without using the conventional draft diverter, fume pipe or chimney. A flame actuated combination thermostat and safety pilot are features of this equipment which requires no electrical connections.

Householders whose homes are equipped with zone or space heating units reduce the gas consumption if shortages develop by setting back the thermostats in all except the occupied spaces, thus reducing gas consumption without discomfort to the occupants.

Dual Fuel Burners

A new approach to the problem of relieving peak load house heating difficulties has been through the use of dual fuel burners, for either gas or oil, pioneered by the Gas Service Company, Kansas City, Mo.

The fluid burner, capable of burning both gaseous and liquid fuels, was developed from a joint research project instituted by the Gas Service Company and the Midwest Research Institute. Hand made models were built, installed and field tested in 1947. Since that time several hundred of the burners have been placed in operation.

An analysis of the effect of dual fuel usage in the Kansas City area (average 4,850 degree days per year) was prepared for *Gas Service*, employee publication of the utility, by C. C. Young, research engineer. He wrote in effect as follows:

The average home in Kansas City re-

quires about 125 cu. ft. of 1,000 Btu gas per hour to meet heat requirements in cold weather. The average annual use of gas in the area is somewhat less than 200 Mcf per year.

Starting with the assumption that gas would be available during moderate winter weather for all heating requirements, providing some form of standby were kept ready for use on the coldest days, the company estimated that an oil storage of 275 gallons capacity would provide from ten to 40 days peak load heating fuel supply, depending on the size of the house and other characteristics that commonly determine heat loss.

The dual fuel burner is connected with an outdoor thermostat that automatically switches the fuel from gas to oil at a predetermined outside temperature.

In the Kansas City area the percentage of standby oil required when compared to total heating fuel requirements for the year, is as follows:

Outdoor Temperature Switchover point Deg. F.	Per cent oil used to total annual fuel required
10	7%
15	10
20	15
25	22

The actual switch-over point from gas to oil may be varied to suit individual distribution requirements. It is obvious that in order to give effective relief to the distribution system at times of anticipated gas shortage, the switch-over must be entirely automatic and out of the hands of the consumer.

One manufacturer of the dual fuel burner describes its operation this way:

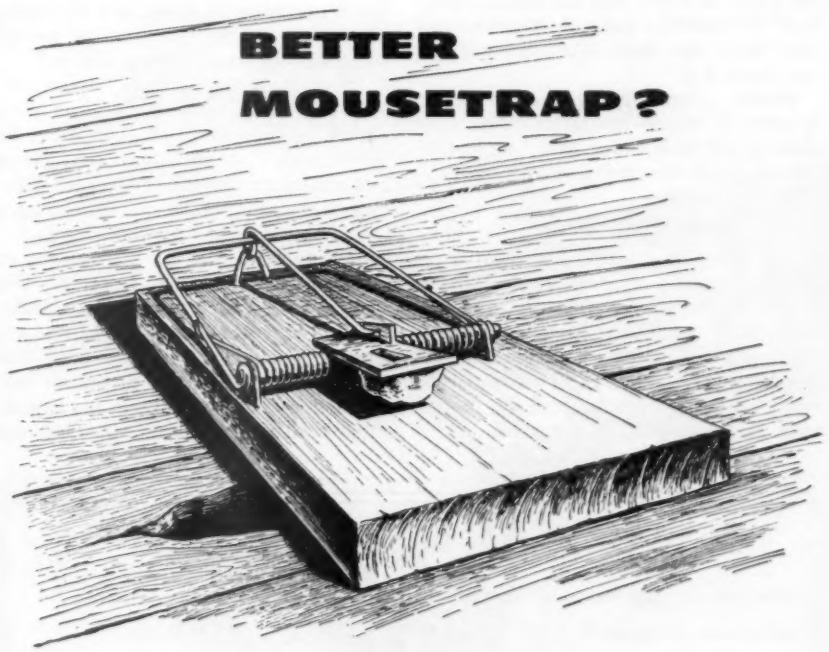
"The burner consists of a spreader flame conversion gas burner of conventional design, in through and around which is built a different oil burner. The combination of burner and controls results in a single unit capable of burning both gaseous and liquid fuels.

"While the oil side of the unit should probably be classed as a vaporizing type, difficulties are overcome by using a small amount of gas (about 10 per cent) with the oil. The gas preheats, and vaporizes the oil, then cleanses the oil burning parts so as to provide continuous and trouble free operation."

The gas and oil circuits are interlocked, making it impossible for both fuels to be burned at the same time, with the exception of the small amount of gas consumed when the burner is operating on the oil side.

Technically and mechanically the burner is out of the experimental class as far as household units are concerned. To what extent it will be accepted by the gas utility industry as a load leveler remains to be seen. It has been pointed out that where a choice of fuels, both readily at hand, is given the customer, it may well be that he will allow oil prices rather than weather conditions to decide which he will burn. While it is true that he would be required, presumably by contract, to change over to oil at certain predetermined lows of outside temperature, would he, if oil was cheap enough, be willing to burn gas even on the milder days when the utility stood ready and able to supply his full heating requirements?

In Missouri, at least, the dual fuel burner seems to have met with the approval of many oil companies and distributors. If the advantages to the latter in the form of increased summer storage of oil, for use during severe winter peaks, are sufficient to compensate for the heating load lost to gas during milder weather, the dual fuel principle might well prove to be the first means of a rapprochement between those two industries in the fight for the house heating load in new natural gas areas.



The story of the reward for a better mousetrap is proverbial. But the fact remains that most mice are still caught by this simple, economical and effective contraption.

Gas purification is a parallel case.

Iron Sponge, preferred for the removal of H_2S seventy-five years ago, is still preferred today. And for these same reasons . . . simplicity, economy and effectiveness.

Iron Sponge operates with high efficiency at high or low pressures, has excellent capacity and activity, gives long service between foulings and is simply and quickly regenerated.

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State Compensation

(Continued from page 29)

N. E. 624; Here the workman left his work to get drink of water. Passmore v. New Amsterdam Co., 147 Fed. (2d) 536; This litigation involved death of a company's employe who fell off a motor truck while returning to the plant in the company's truck after work. The testimony showed that the employe had worked all day for the company. *Instead of going directly home* from the job, he decided to ride the company's truck to the plant and start from there to his home. The employes were not paid for the time consumed in riding to and from the place of work. But the higher court held the employe entitled to compensation under the State Workmen's Compensation Act.

Hence, it is quite apparent that an employe is within the scope of his employment if he is *either* under control of the employer, or serving the employer.

Injured During Lunch Hour

According to a recent higher court an employe cannot recover compensation under the State Workmen's Compensation Act if the injury is received while the employe is off duty and free to leave his employer's premises. This is so although the employe sustained the injury while on the employer's premises.

For example, in Theberge v. Public Service Electric and Gas Co., 51 Atl. (2d) 248, it was shown that an employe named Theberge was employed by the Public Service Electric and Gas Co. as a gas regulator man and his duties consisted of the regulation of gas devices and painting gas holders at the gas plant and in the territory served by the company. One day Theberge was injured while ball playing for his own amusement during his lunch hour.

The higher court held the injury was not compensable, as resulting from "accident arising out of and in course of employment." The court said:

"He (employe) was free to spend his lunch period as he chose and the matter of staying on the premises or leaving them was his free personal choice."

Modern higher courts consistently hold that an employe who files an application for compensation under the State Workmen's Compensation Act cannot also sue his employer for damages. However, numerous officials of gas corporations unintentionally forfeit rights to protection against suits for damages by injured employes by failure to comply with state laws. A review of compensation laws in different states discloses that employers who have faithfully paid state compensation insurance premiums may be sued by employes who are injured either "wilfully" or because the employer has in some manner failed to comply with "lawful requirements for the protection of the lives and safety of employes."

Failure to comply with "lawful requirements for the protection of the lives and safety of employes" means that the employer did not provide safety devices, guards, or other structures required by state laws.

Erroneous Belief

The average official believes that when an application for insurance is accepted by the state industrial commission the company is protected against any and all suits by injured employes for damages. Nevertheless, it is well known among law experts that under various and many circumstances the state compensation laws only *partly* accomplish the desired and intended purposes.

Obviously, it is not the intentions of the lawmaking bodies, when enacting state compensation laws, to leave loop holes through which injured employes may recover damages from their employers, in addition to the regular and lawful compensation. In fact, if officials of gas corporations understand and abide by compensation laws, ample protection is afforded both the corporation and employes who must accept and be satisfied with the amount of compensation specified by the state laws.

For illustration, in a recently decided case the higher court said that the purpose of the legislature, when enacting state compensation laws, is to provide reasonable compensation to injured employes, or dependents of employes killed while performing their work, *whether or not* the accident was caused by negligence of the employer, and also to accumulate funds from premiums paid by employers with which to pay compensation and thereby guarantee employers *protection against expensive law suits for damages*. This same court explained further that all employers must *strictly* conform with the provision of the state compensation laws, in order to remain under the protective arm of the law.

Must Conform With Law

While the compensation laws of all states are not identical, these various laws are in many respects identical. The first important consideration is the fact that the usual state laws provide that all employers who post notices in their place of business, stating that they have industrial insurance, shall *not* be sued by injured employes, or their dependents, for damages.

The importance of this law is that if officials of a gas company forget to post these notices, or the industrial commission fails to send the notices to the insured company, the latter is guilty of vio-

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lating the law and the employe need not accept compensation payments for injuries, but he *can sue* for damages. The law books are full of cases filed by employes against employers who fail to conform strictly with this particular provision of the law.

Some gas companies carry compensation insurance for their employes by paying premiums directly to the state; other companies by permission of the state industrial commission carry their own insurance; while other companies carry insurance under the State Workmen's Compensation Act, and also carry insurance with private insurance corporations.

Irrespective of the kind of compensation insurance in effect, the industrial board has the power and authority to decide whether an injured employe is entitled to receive a compensation award under the State Workmen's Compensation Act. Obviously this same rule is effective with respect to dependents of a deceased employe.

It is important to know that gas companies may carry "double" insurance and thereby very frequently profit. This is so because only employes injured within the scope of their employment may receive compensation under the State Workmen's Compensation Act. Hence an employe injured while acting outside the scope of his employment may sue and recover heavy damages from the gas company. Under the latter circumstances a private insurance company which issued the gas company an indemnity or liability insurance policy must stand the financial loss, thus relieving the gas company of financial loss.

For example, in Moss v. Barnett Co., 35 S. E. (2d) 867, the testimony showed that an employe was injured through negligence of his employer, but the injury was sustained while the employe was acting outside of the scope of his employment.

In this case the company carried, in addition to compensation insurance under the State Workmen's Compensation Act, an indemnity insurance policy with a private insurance corporation. The latter insurance policy contained a usual clause to the effect that no employes of the company were insured "when engaged in employment."

Therefore, it is quite clear that the company was insured doubly, that is: (1) the company was protected under the state workmen's compensation act for injuries to employes injured while acting within the scope of their employment, and (2) the company had insurance with a private insurance company for injuries to employes while *not* attending to their regular work.

It is interesting to observe that the higher court decided that the employe was not injured within the scope of the employment, and therefore was not entitled to compensation under the state workmen's compensation act, but that the injuries resulted from negligence of the employer.

The higher court held the company liable in $10,000.00 damages and also held that the private insurance company must pay this amount to the employe.

Prince Georges Gas Gets OK To Build 20 Mile Line

The Federal Power Commission has authorized Prince Georges Gas Corp. to construct and operate approximately 20 miles of 22 inch natural gas pipe line between a point of connection with the pipe line facilities of Atlantic Seaboard Corp. and applicant's storage and compressor station.

The new pipe line will be used to transport increased volumes of natural gas from Atlantic Seaboard's facilities for delivery to the Washington Gas Light Co. and the Washington Gas Light Co. of Maryland.

The facilities authorized will have delivery capacity of 122,000,000 cu. ft. of natural gas a day, which is required to meet increased demands for gas service in the District of Columbia and adjoining areas.

Estimated over-all cost of the proposed facilities is $1,350,000.

Reynolds Service Regulators are built to meet specific requirements—years of operation in the field through a complete range of operating conditions have proved not only their superiority but their durability. With parts so precisely machined for each model that they are completely interchangeable. The accuracy you require in performance is assured.

MODEL 10

Dead Weight or Spring Type, with or without Mercury Seal, or Dead Weight Safety Seal or diaphragm operated relief valve. All working parts are so accessible as to be interchangeable without removal from pipe line.

MODEL 20

Dead Weight or Spring Type, with or without Mercury Seal, or Dead Weight Safety Seal or diaphragm operated relief valve. All working parts are so accurate as to permit complete interchangeability in shop.

MODEL 30

For horizontal or vertical connections, with or without removable valve pocket. Available with either Spring or Dead Weight adjustment. With or without Mercury or Dead Weight Safety Seal or diaphragm operated relief valve.

Reynolds Gas Regulator Co.
ANDERSON, INDIANA, U. S. A.
GAS CONTROL SINCE 1892

PCGA Meeting

(Continued from page 32)

service were automatically drawn by the machine. The Public Utilities Commission supervised the procedure.

Prior to the conversion to natural gas, the company had served a mixed gas of 660 Btu value. The company, during the period of 1940 to 1945, was endeavoring to build its house heating load by promoting conversions to gas heat. A 12-months campaign was inaugurated beginning in January. In January and February, the advertising stressed "Sick Furnaces" and a typical headline used was "15,000 Minneapolis furnaces are sick and need a doctor."

In March and April the campaign was labeled "Spring Tryout" and the inconvenience of lighting coal furnaces in the spring months during the intermittent cold snaps was stressed. The company offered to install conversion burners for $5.00 down and nothing until fall, and customers who turned in prospects were paid $5.00.

A survey of customer acceptance of various types of appliances made in 1936 revealed a very wide-spread belief in the superior cleanliness of electric cookery among the company's customers. To overcome this, the company put on an intensive advertising campaign, and within 15 months a second survey showed that people had changed their opinion, and gas had a much higher acceptance insofar as cleanliness was concerned.

George F. Mitchell of The Peoples Gas Light & Coke Co., Chicago, followed Mr. Mitchell to the rostrum. His paper appears on page 21 of this issue of AMERICAN GAS JOURNAL.

The last speaker at the Tuesday afternoon session was Owen Clark, chairman of the Washington Public Service Commission, who talked on the "Role of Regulation." Mr. Clark opened his remarks with a statement that the Washington Public Service Commission and all other state regulatory bodies with which he was acquainted are dedicated to the principle that sound, sensible and equitable government regulation of certain industries affected with a public interest is the greatest bulwark against government ownership of those industries.

In connection with the situation in the Northwest, he stated that it was his sincere belief that the only circumstances which can save the Pacific Northwest gas industry from complete destruction is the importation of natural gas.

A novel idea for a convention was introduced on Wednesday when the entire delegation of 600 people, including members and their wives, embarked on the Princess Marguerite for a voyage to Victoria. At Victoria, luncheon was served in the Crystal Gardens. After lunch the busses took the delegates through the lovely Butchart Gardens and the party returned to Seattle on a sister ship, Princess Patricia. At the noon luncheon, James F. Pollard, manager of the commercial department, Pacific Gas & Electric Co., introduced the past presidents of the Pacific Coast Gas Association, and R. T. Peterson, superintendent of gas supply, Pacific Gas & Electric Co., gave the report of the Awards Committee.

On Thursday morning, the matter of adequate rates was approached from a slightly different angle by Joseph C. Muckley, vice-president of Seattle First National Bank, who was the first speaker of the session. Mr. Muckley stated that the task of securing money to finance the tremendous expansion of public utilities in the West is growing more difficult due to the deterioration of earnings.

The final speaker of the three-day session was K. W. Stookey, President of the Gas Machinery Co., Cleveland, Ohio. He presented a technical paper on the use of high Btu oil gas which appeared in the August 1950 issue of AMERICAN GAS JOURNAL.

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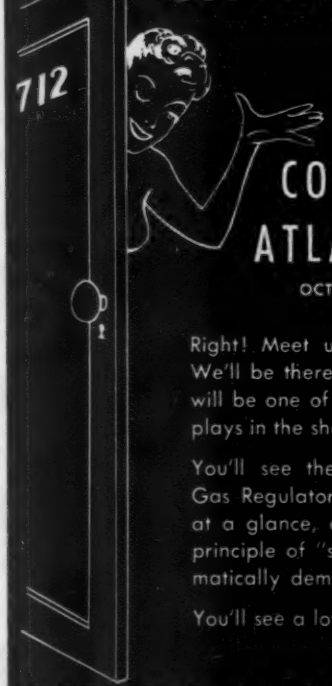

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Backlog of New Issues

(Continued from page 30)

writers' shelves and reduced the total bond inventory on hand to just about nil.

The average yield on first grade corporate obligations now is back to 2.60 per cent and the second and third quality issues are at 2.61 per cent and 2.73 per cent, respectively. At this point they are practically back to their level at the 1949 year-end.

Part of this paring of yields may be due to the lifting of pressure which would be exerted by a heavy volume of new offerings. It remains to be seen how the market reacts to the flow of new corporate issues indicated for the early future.

Offsetting any possible weakness in the market itself, however, is the likelihood that construction programs of the gas industry may not stay as long as anticipated at present record breaking high levels but may fall off more quickly and more precipitately than a recent survey of the industry indicated.

Shortages of steel and much higher prices for materials and labor conceivably might cause postponement of some ambitious pipe line construction programs designed to transport natural gas from southwestern fields into New England, the Great Lakes district and the Pacific Northwest, unless sponsors of these projects can show urgent need for the fuel by industry closely geared to war production.

High costs already are slowing up the new housing pace in some localities, and Federal Government or municipal curbs may apply a further brake.

Some of the leading natural gas companies which already had planned heavy expansion outlays are preparing cutbacks in construction to compensate for expected lower home building activity.

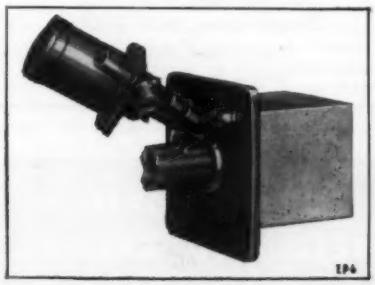
As a result, they may require a smaller amount of bank credit to tide them over temporarily in the event market conditions should not be favorable to their proposed financings, which include a substantial proportion of common stocks.

American Natural Gas Co., whose system comprises a new natural gas pipe line from Texas to Michigan and Wisconsin, and distribution facilities in the latter two states, has adhered to its original schedule by offering 304,458 new common shares to stockholders of record August 24, last. The offering closes September 14 and the shares are priced at $22 to yield about 5.4 per cent.

The success of this offering presumably will be watched for a clue as to whether the managements of other natural gas companies, and of utilities generally, will go ahead with plans to finance a part of their new money requirements through sale of equity shares.

Series PW McKee Sealed Burner With Flame Failure Protection

The latest addition to the McKee-Eclipse line of Walltite burners is the new series "PW" piloted Walltite burners offered by Eclipse Fuel Engineering Co., Rockford, Ill. This is a sealed burner designed for gas-burning installations requiring instantaneous flame failure protection and constant pilot.



This combined protection is obtained by incorporating into the Eclipse company's Walltite burner design a McKee blast type constant burning pilot located in a low-velocity zone, to insure instantaneous ignition at all rates of firing—and an electrode for electronic flame failure protection. The electrode is at the junction of the pilot flame and main burner stream in order to assure safe operation.

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DISC TYPE CHECK VALVE

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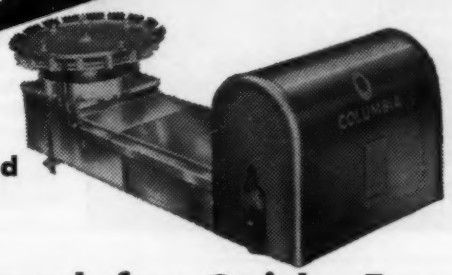
For GAS and AIR
LOW and HIGH PRESSURES

Can be supplied for use with any pressures. Easily lubricated through grease fitting. Indicator shows position of disc. Can be counter balanced for vertical jobs. Dash pot can be installed to prevent chattering when passing high velocity gas or air.

NORWALK VALVE COMPANY
South Norwalk, Conn.

COLUMBIA Model "J" *Conversion* **GAS BURNER**



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One Burner for all Types of Gas

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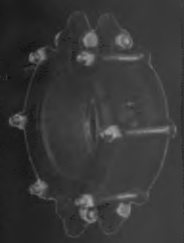

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Utility People Are Prominent In Controllers Institute

John B. Cookenboo, controller, Houston Natural Gas Corp., has been re-elected vice-president of the Houston Control of the Controllers Institute. Carl B. Myers, treasurer of the Tennessee Gas Transmission Co., and Ronald L. McVey, controller of that firm, have been elected directors of the local group.

At the annual meeting of the Institute's Cincinnati Control, William H. Zimmer, vice-president and treasurer, Cincinnati Gas & Electric Co., was chosen secretary.

Recording Gauge Bulletin Published by Bristol

The Bristol Company, Waterbury 20, Conn., has available a 32 page bulletin, G-626, on its "Series 500" line of recording gauges. It contains information on pressure gauges for ranges from 0 to 2 in. of water to 0 to 10,000 lb. per sq. in. vacuum gauges, low range draft and pressure gauges, barometers, and absolute pressure gauges for ranges as low as 0 to 6 millimeters of mercury absolute. Measuring elements, operating principles, recording charts and accessories for the various types of recording gauges are described. Information is also included on Bristol instruments for automatic controlling and telemetering of pressure and vacuum values. The bulletin is illustrated.

FPC Approves Construction Of Two Underwater Lines

The Federal Power Commission has granted temporary authorization to Texas Gas Transmission Corp. of Owensboro, Ky., for the construction of two 3.4 mile, 20 inch submarine pipe lines across the Mississippi River in the Greenville area.

The authorization also includes the construction of 1.93 miles of 26 inch pipe line to interconnect the submarine lines with the Texas Gas 18 inch and 26 inch pipe line systems. Estimated cost of the construction is $1,457,959.

Texas Gas said the lines are necessary because of the failure during the early spring of 1950 of four of its submarine crossings in the Greenville area. The failure has caused a pressure drop at the river crossing which has resulted in a decrease in capacity of its two systems.

Rates for Natural Gas

(Continued from page 23)

of years. Its history is closely identified with the growth of the natural gas industry.

In conclusion, may I state that the difficulties of most manufactured gas properties are caused by violently fluctuating costs of materials entering into the manufacturing process. Natural gas rates are relatively stable. Therefore a supply of natural gas is highly desirable from the standpoint of the customers, the company and the stockholders.

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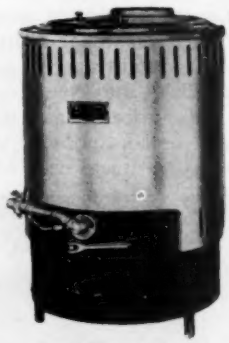

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World Power Conference

(Continued from page 27)

sion costs, and it is therefore proposed to establish a thermo-electric power station at Tavazzano in order to consume a considerable part of the gas near the point of production. A detailed account is given of this installation, which will have a power output of 120,000 kw.

A second project is to utilize natural gas near the point of production for the manufacture of synthetic ammonia. The plant is to be designed to produce 60,000 tons of ammonia per year, and is to be constructed in the Po valley which is also the most important market for nitrogenous fertilizers. Details are given of the processes to be employed. It is proposed to make the hydrogen required by the partial combustion of natural gas with oxygen.

Development Problems in the Gasification of Liquid Fuels: Jacque (F)

The gas industry in France makes use of the pyrolysis of gas-oil for regulating the calorific value of the gas distributed, for meeting peak loads, and for establishing units of moderate size and flexible output in isolated districts. Consumption of gas-oil in this way is much less than in Great Britain and the USA; it is controlled firstly by the relative costs of coal and gas-oil, and secondly by availability. In Europe, the increase in demand for gas-oil for many purposes, and the increase in availability of fuel oil from the expanding refinery capacity, will make it desirable that fuel oil should, if possible, replace gas-oil for carburetting water gas.

The variation in carburetting value is considerable for gas-oils, but is much greater for fuel oils, and control of quality is therefore most desirable for the gas industry. Other difficulties in the use of fuel oil arise from (1) its greater tendency to form deposits, (2) its lower hydrogen content, (3) its lower thermal yield, and (4) its higher viscosity. American methods of overcoming these difficulties are well known, but a method which is in the experimental stage in France is of interest.

For the efficient gasification of fuel oil it is necessary to obtain a large part of the hydrogen it contains in the form of hydrocarbons, and to gasify the carbon deposit with, for example, steam or oxygen. The gasification of the carbon in this way can be more readily effected if the cracking of the oil is carried out on a granular refractory material which can be circulated to a regeneration zone. Thus, in an experiment in which fuel oil was cracked over alumina, and the carbon subsequently gasified with air and steam, the thermal efficiency of the whole operation was about 80 per cent.

Manufacture of Fuel and Synthesis Gas in the United States: Newman, Schmidt, and Batchelder (US)

The contribution made by natural gas to the total gas used in the United States is much greater than that of gas manufactured from coal, coke, and oil. Thus, in 1945, the consumption of natural gas was $2{,}550 \times 10^{12}$ Btu., and of manufactured gas was 455×10^{12} Btu. The consumption of natural gas is, moreover, increasing more rapidly than that of manufactured gas, the respective increases in the past decade being 134 per cent and 51 per cent.

Carburetted water gas provides a steadily increasing proportion of the gas manufactured by public utilities, and the use of oil for this purpose rose in the decade ending in 1948 from 67×10^6 to 144×10^9 cu. ft. Between 1947 and

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1952, however, oil consumption by the utilities is expected to decrease by about 50 per cent, and to be replaced by natural gas.

Synthesis gas in the United States is produced chiefly from coke or natural gas for the manufacture of ammonia and methanol. The volumes of synthesis gas (equivalent to hydrogen) produced in 1948 were $82{,}000 \times 10^6$ cu. ft. from coke, and $62{,}000 \times 10^6$ cu. ft. from natural gas. Use is now being made of oxygen for the production of synthesis gas from coke for ammonia, and from natural gas for synthetic liquid fuels.

Trends in methods of gas manufacture are surveyed in the paper. New methods include processes for making oil-gas, which use water-gas equipment modified to eliminate the generator fuel bed. Apart from reducing coke consumption, the object of such processes is to provide high-heating-value gas, and thus increase the capacity of the distribution system. Other developments, which are primarily of interest in connexion with the problem of meeting peak loads, are the reforming processes in which hydrocarbon gas is reacted with air, or air and steam, in the presence of a catalyst; the possibility of gasifying liquid products of petroleum in this way is being investigated.

New processes which are being investigated for the gasification of solid fuels with oxygen are outlined, and the processes being used, or studied, in the United States for removing organic sulphur and hydrogen sulphide from gas are briefly reviewed.

The Recovery of Methane from Coal Mines: Venter and Stassen (B)

Methane formation is associated throughout geological time with the maturing of coal, and the extent to which it is retained in the coal seam is dependent on the permeability of the overlying strata. When the coal seam or an adjacent seam is worked, the pressure of the overlying strata causes the expansion of the rocks towards the working, and hence fissuring and disintegration of the seams occur.

The working of a coal seam or an adjacent seam thus facilitates the liberation of methane in the seam which can then be drained by means of bore holes. Methane drainage in this way was started in Germany in 1943 at the Mansfeld mine, where 200×10^6 cu. ft. of methane were collected from April 1, 1943, to November 20, 1944. Subsequent operations to collect methane at several other mines in Germany were carried out with varying degrees of success.

In Belgium, methane drainage has been practised since 1949 at two mines: "Charbonnages de Ressaix" at Ressaix, and "Charbonnages Belges" at Frameries; both mines are producing regularly 706,000 to 880,000 cu ft. of methane per day. The method adopted has been to drill bore holes from the main roadway to the surface, the borings being inclined at an angle of about 45° to the horizontal.

It is estimated that in the coal fields of the south, particularly in the Hainaut area, methane could be collected at about 20 points, each yielding about 706,000 cu. ft. per day. The Liege coal field could produce only a few hundred thousand cu. ft. The Belgian mines can therefore be expected to produce a total of the order of 1,760,000 cu. ft. per day. As regards the distribution of the methane, there is already in existence a fairly extensive grid system for coal gas distribution on the line Antwerp-Brussels-Hainaut, and projects are being considered to link this with Liege and Campine.

Methane has many possible uses, but in the early stages, at any rate, the whole yield will be taken by the gas industry.

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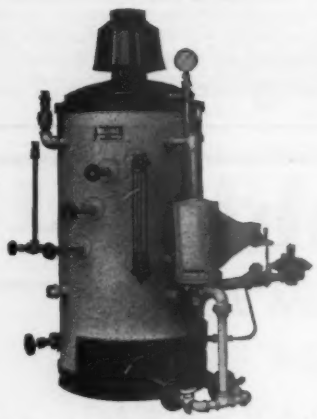

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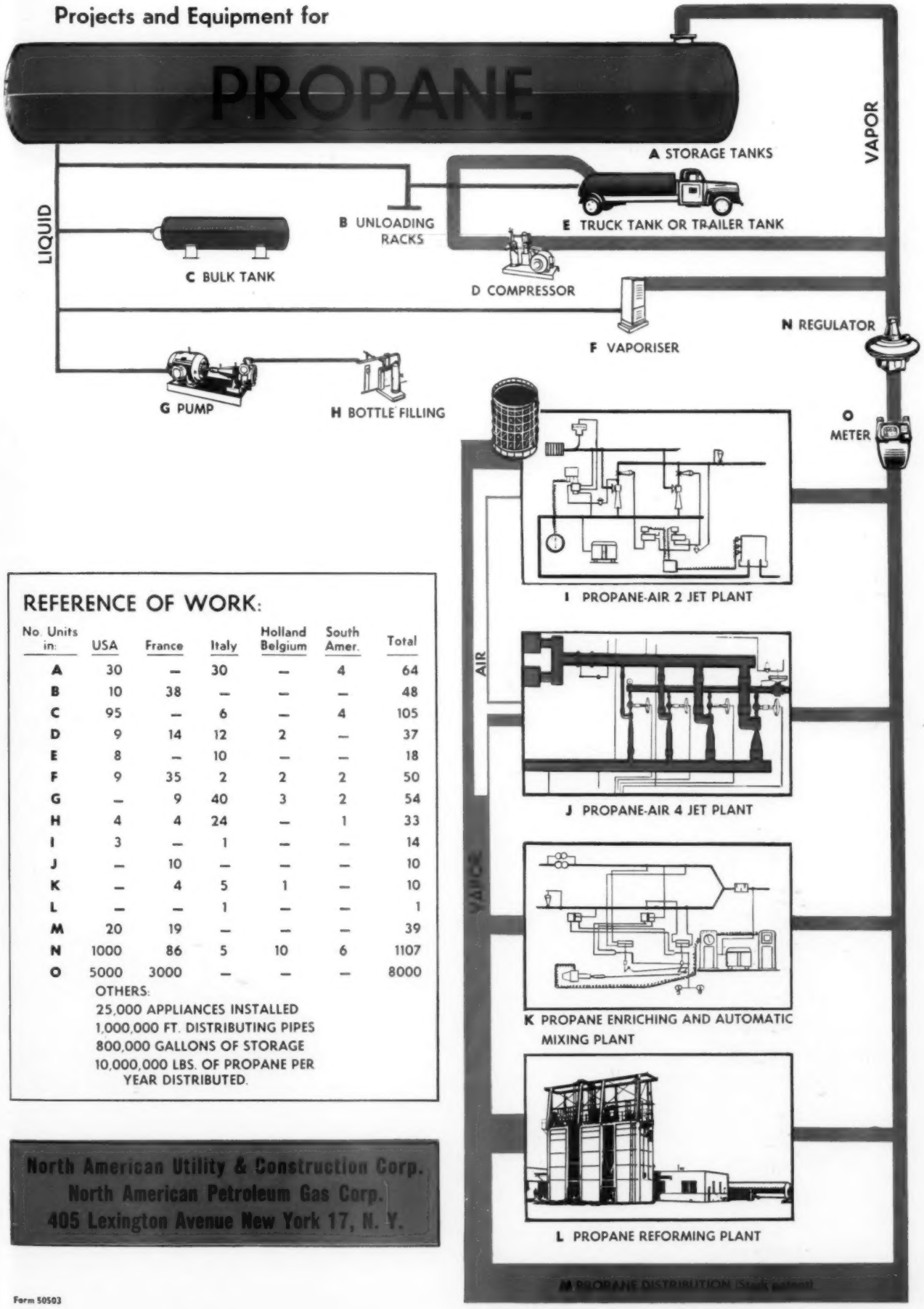

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D	9	14	12	2	—	37
E	8	—	10	—	—	18
F	9	35	2	2	2	50
G	—	9	40	3	2	54
H	4	4	24	—	1	33
I	3	—	1	—	—	14
J	—	10	—	—	—	10
K	—	4	5	1	—	10
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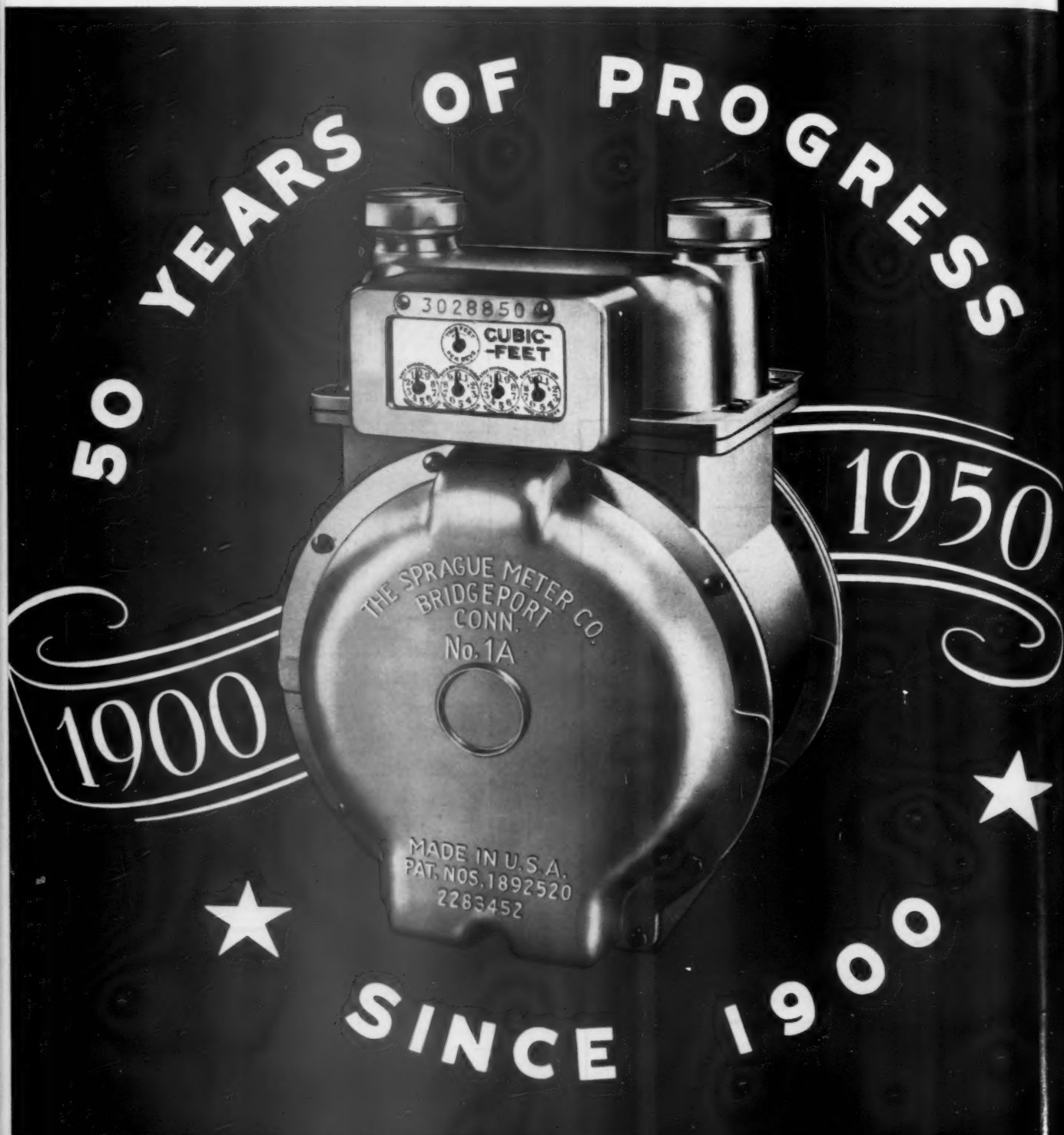

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